



# Programming

*with the*  
DEP-100S/105S Hand-Held Terminal  
*for*  
*Program D11005*

Revision 02  
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Part No. M-035019

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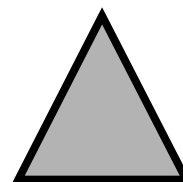


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. . . . .

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3,736,445	4,289,951	4,463,244	4,851,635	5,589,088
4,001,540	4,301,351	4,513,363	4,885,451	5,757,176
4,104,724	4,388,515	4,516,008	4,945,201	5,793,243
4,251,764	4,399,511	4,733,045	5,386,096	5,128,507
4,254,466	4,456,809	4,804,819	5,449,877	5,424,506
4,282,417	4,459,456	4,831,229	5,128,507	5,589,088
4,289,948	4,459,457	4,849,873	5,424,506	5,757,176
				5,793,243

Additional patents are pending.

## Acknowledgments

. . . . .

MedLAN is the proprietary local area network used to interconnect products manufactured by WTC.

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. . . . .

WTC is committed to quality products, service and support. Our service department maintains an assistance hotline to assist with application or troubleshooting problems during normal business hours.

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**By E-mail:** When an immediate response is not critical, contact WTC at the following e-mail addresses:

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<b>welding-support@its-wtc.com</b>	Technical Support

WTC's technical support will respond within 24 hours, Monday through Friday, to your e-mail requests. Please include your name, company name, location, product part and serial number and a description of the problem with your request. Be sure to indicate how you want us to respond, and include applicable phone and fax numbers with your e-mail address.

**On the Web:** Visit our Web site at:

**[www.weldtechcorp.com](http://www.weldtechcorp.com)**

**By Mail:** Contact us by mail at the following addresses:

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24775 Crestview Court	240 Cordova Road
Farmington Hills, MI 48335	P. O. Box 8858
	Oshawa, Ontario L1J 1N9

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. . . . .

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# Warnings Contained in This Manual

. . . . .

In compliance with the CE standard, the following symbols are used to identify safety instructions. Their meaning is as follows:

---

**Danger!**

*This symbol will be used wherever the failure to observe safety measures may result in death, severe bodily injury, or considerable damage to property.*

---

---

**Warning!**

*This symbol will be used wherever insufficient or lacking compliance with instructions may result in personal injury.*

---

---

**Caution!**

*This symbol will be used when insufficient or lacking compliance with the instructions may result in damage to equipment or files.*

---

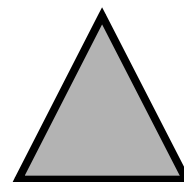
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**Note:**

*This will be used to inform the user about special features or where to find more information.*

---





# Overview of the DEP-100S

---

1

The WTC DEP-100S data entry panel is a compact programming device. It can communicate with up to 30 WTC weld devices through the MedLAN network.

The DEP-100S allows you to program weld schedules, set-up parameters and a stepper profile, then download the information to the weld control unit. It also receives weld summary data uploaded by the weld control and displays weld results.

When power is applied to the DEP, it polls the MedLAN network to determine the active devices. Each active device responds with information about its software and features:

- Software version, revisions and any unique control characteristics
- Current weld schedules
- Stepper programs, stepper type(s) and their assignments to weld schedules
- Set-up parameter settings
- Control fault and event status

Each weld control functions independently. The data displayed by the DEP-100S for each device varies, based on its software and features.

For example, some software versions provide two types of steppers: the conventional linear stepper and a WTC SureWeld stepper. Other versions provide only the linear stepper. The stepper displays you will see (when programming the stepper for a weld control) are based on the software in the weld control.

This manual provides sample displays typical of the information you'll see. However, the actual display will depend on the capabilities of the weld control software.

**Note:**



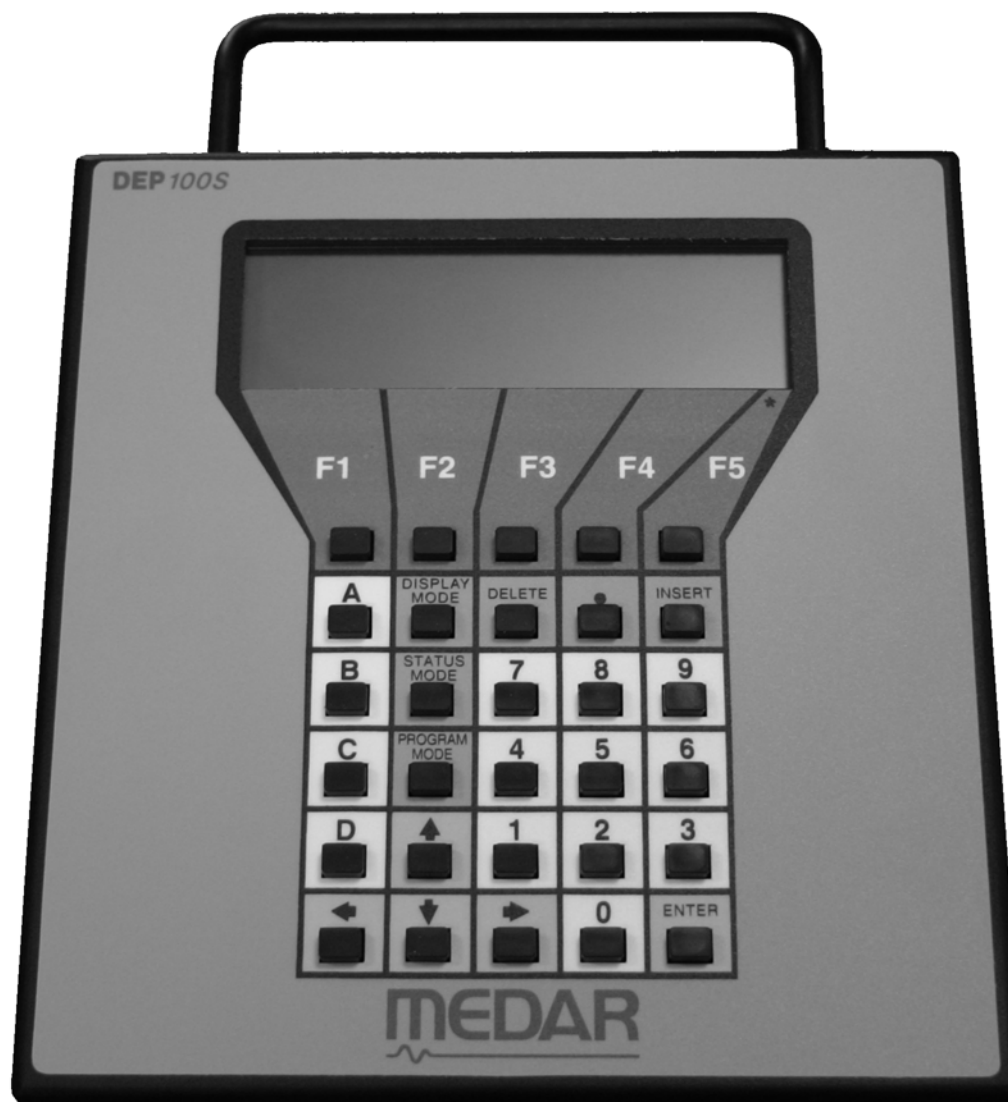
*Refer to the weld processor manual for a description of how to operate any non-standard displays.*

## Keypad

. . . . .

The following shows the layout of the hand-held terminal:

**Figure 1: DEP-100S  
Keypad Layout**



The DEP-100S provides a message display area and push button keys to request status displays or make programming changes. The function keys allow you to perform programming tasks, reset faults, request status displays and to reset the DEP-100S.

The keys are color-coded and grouped according to the function they perform:

- Mode keys (grey)
- Cursor Movement keys (yellow)
- Insert, Delete and Decimal point key (grey)
- Numeric keypad (white)
- “Soft” keys (blue)

Each is described in the following sections.

## MODE KEYS

The three mode keys on the DEP-100S are used to select the type of operation desired:

- DISPLAY MODE
- STATUS MODE
- PROGRAM MODE



When you press these keys, the display shows a menu of options available from that mode. To select an option from this menu, press the function key (**F1**) through (**F5**) indicated on the menu.

## CURSOR MOVEMENT KEYS

The four directional arrow keys (**↑**, **↓**, **→** and **←**) are used to move the cursor and to scroll display lines.





<b>↑</b> and <b>↓</b> (Up and Down Arrow Keys):	These keys scroll up or down through a list on a display.
<b>←</b> and <b>→</b> (Left and Right Arrow Keys):	These keys move the cursor <i>within</i> a display.

## INSERT, DELETE AND DECIMAL POINT KEYS







INSERT:	This key inserts a new function into a weld schedule. The new function appears <i>after</i> the function where the cursor is displayed.
DELETE:	This key deletes the selected function from a weld schedule. (The selected function is indented and highlighted by the cursor on the second line of the display.)
 (Decimal point):	The Decimal point key (  ) selects a security display. (The security operation is defined by the weld control software.) It can also be used to enter a decimal value.

## NUMERIC KEYPAD

Use the following keys to change the values for programmable functions or features.

 through  .	Use the number keys to enter new values. When the display shows a cursor and you press one of these keys, the value being changed blinks on the display.
 .	Press  to place a new value into DEP-100S memory. (The value is not changed <i>at the weld control</i> until you download your changes.)

## ALPHA KEYS

 -  .	The keys labeled  ,  ,  and  are currently unassigned.
---	--

**"SOFT" KEYS**

Five "soft" keys, **[F1]** through **[F5]** perform different functions, based on the display and programming key selected.

For example, when you press the **PROGRAM MODE** key, you'll see the following display:

HHT #200		COMM ON	
.....			
- PROGRAM MODE -			
REVIEW SCHEDULE	REVIEW STEPPER	REVIEW SETUP	RELOAD DEFLT *
.....			
F1	F2	F3	F4

This shows a menu of programming functions. To select from this menu, press the soft key shown below the option. For example:

- **[F1]** requests REVIEW SCHEDULE
- **[F2]** requests REVIEW STEPPER
- **[F3]** requests REVIEW SETUP
- **[F4]** requests RELOAD DEFLT

**Note:**

*Notice the asterisk (\*) in the lower right of the display. An asterisk means that more menu options are available. To see the other options, press **[F5]**.*

From this display, press **[F5]** to request

- WELDER ID (**[F1]**)
- TRANSFER DATA (**[F2]**)
- NETWORK ADDR (**[F3]**)

Press **[F5]** a second time to return to the original menu. Each time you press this key, you'll switch between the available menus.

## TO RESET THE HHT

Press the **[F5]** and **[Enter]** keys at the same time to reset the DEP-100S. (This cycles power to the device, but does not have any impact on the weld controls *or* the network).

When you reset the DEP-100S, it executes its power-up sequence, again polling every weld control on the network to determine the identification and address of each active WCU.

## DEP-100S Display

. . . . .

The display has 8 lines. Each line has 40 characters. Two dotted lines separate the following groups of information:

- The top line indicates power and network communication status.
- The four middle lines display the information from the three mode keys.
- The bottom line displays the functions currently assigned to the “soft” keys (**[F1]** through **[F4]**).
- When you see the \* in the lower right corner of the display, it means an additional function or feature is available; press **[F5]**.

Some of the values you’ll see can be changed. You can tell which ones they are using the “cursor” (a shaded block on the display).

## ABOUT THE CURSOR

The cursor shows where you are on the display. It allows you to “select” an item from the display, to tell the DEP-100S which item you want to change.

To change a value, use the arrow keys to move the cursor to that item.

### Note:



---

*If you can change a value (if it is programmable), the arrow keys will stop the cursor under the display. If the cursor will **not** move to a value, it is not programmable.*

---

If the cursor moves to the item, it blinks to tell you that it will be changed if you enter a new value (using the number keys). When you press **Enter**, the value showing on the display will be stored in memory.



**Hint:**

*The new value is now in **DEP-100S** memory, not the **weld processor** memory. The new value does not affect the weld control UNTIL you download the new setting to the weld control.*

## HOW TO CHANGE A VALUE

To change a value, use the arrow keys to move the cursor to the value you want to change. (If the value is not programmable, the cursor will not stop.)

When the cursor is in position, use the number keys to enter a new value. The press **Enter** to place the value into the DEP-100S memory.

When programming a weld schedule, move the cursor to the programmable value, enter the value and then move the cursor to the next value you want to change. (You do not need to press **Enter**.)

When you are done programming the schedule, press **F3** to download the new schedule to the weld control (wcu#) selected.

HHT #200 COMM ON

.....

S T A R T   O F   S C H E D U L E

\_LINEAR STEPPER #01 ASSIGNED (0=OFF)


SEC. CURR LIMITS: HI=00000 LO=99990

wcu #00      sch #01      download      exit









.....


F1
F2
F3
F4

For example, on the weld schedule display shown above, the cursor is on the first function in the sequence: LINEAR STEPPER #01 ASSIGNED (0=OFF).

The cursor shows which function is selected, but it is not under a programmable value. To change the stepper number assigned by this function, press the  key. (The cursor moves under the value #01.)

You can *now* press:

-  and  move the cursor along the current line of the display. (In the example, it will move between the first space on the line and the stepper number.)
-  to move to the *next* function in the weld sequence.
-  to move to the *previous* function.
-  to see the same sequence for another weld processor (wcu#)
-  to see a different weld schedule (sch#)
-  to send your changes to the weld processor selected (the wcu # displayed)
-  to return to the Program Mode menu

When the cursor is positioned on a value, it blinks until you either press  or move the cursor to another field.

The actions available are different, based on the display you've selected. For example, the cursor will not move to any value shown on a status display, because those values cannot be changed. This manual describes each display.

## SYSTEM STATUS LINE

The top line of display shows the following system status conditions:

HHT #nnn	This message in the upper left of the display when power is applied. This is the HHT's network location (address).
FAULT	This appears in the upper middle of the display when at least one WCU detects a condition programmed as a fault in the set-up parameters.
ALERT	This word in the upper middle of the display indicates that at least one WCU detected a condition programmed as an alert in the set-up parameters.



COMM ON	You'll see this message in the upper right to indicate data is being transmitted between the DEP-100S and a weld control.
---------	---

## Network Communications

. . . . .

The DEP-100S communicates with each device through MedLAN (WTC's Local Area Network). This proprietary communications protocol defines the formatting of messages and commands. This scheme allows WTC's computer-based devices to share information by allowing one DEP-100S to communicate with up to 30 weld controls.

MedLAN designates the DEP-100S as the "master" device (controlling all data transmissions). The weld control units are considered the "slave" devices, because they cannot initiate communications. (They can only respond to requests for data from the DEP-100S.)

### MEDLAN ADDRESS

The DEP-100S sends each transmission to a specific device, which is identified as a unique location on the network, identified by an address.

Each weld control responds only to the messages sent to its address. The address of each control is determined by its MedLAN base address.

To program the MedLAN address for a weld control you'll use the Network Addressing features provided in the Program Mode display. (For more information, see "Network Address" on page 2-18.)

#### Note:



*In some weld devices, the MedLAN address is determined by the weld control hardware. Refer to the Operator's Manual provided with your weld device.*

**Note:**



*In some weld devices, the MedLAN address is determined by the weld control hardware. Refer to the Operator's Manual provided with your weld device.*

POWER-UP

Applying power to the DEP-100S shows a display similar to this example (for HHT program D07005 or greater):

```
HHT #200
.....
                Programming Interface
                D07005  0001
                wcu #00
                T96312-00-01  66636M1
.....
                F1                F2                F3                F4
```

One or more HHTs can operate on the MedLAN network. HHT#nnn identifies the network address of this particular HHT.

Any number of HHTs can operate on a network. However, adding devices causes the polling time to increase. Generally, you will use one HHT for all monitoring and programming, with a practical limit of four HHTs.

The last two digits of the program number (pgm #) indicate the revision level of the DEP-100S software. The number preceded by L is the Loader program number (which enables a WTC technician to reload the software in the DEP-100S via your communication network). The date (mm/dd/yy) shows when the revision was released.

NETWORK POLLING

After a few seconds, the DEP-100S polls each device to determine which ones are active. It also checks the software program for the weld control, to verify that it is compatible with the program in the DEP.

The DEP-100S polls the WCU to determine the WCU ID (program number, device type, revision number and hardware compatibility) and the fault information stored in each weld control's battery-backed RAM memory.

**Note:**

*The DEP-100S continually polls the WCUs to determine if there is information to upload. (Each WCU waits until it is polled before sending any information.)*

### Polling Displays

To watch the polling process, press **F5** and **Enter** (to reset the DEP):.

```

HHT #200                                COMM ON
.....
      Programming Interface
      D07005  0001
      wcu #00
      T96312-00-01  66636M1
.....
      F1              F2              F3              F4
  
```

This shows

- The software program number and revision level of this HHT,
- The number of the device being polled (wcu #00)
- The software program number (T96312) and revision level (0001) of the device and
- The hardware assembly and revision level of the device (66636M1).

If a control does not respond, the following message appears:

```

HHT #200                                COMM ON
.....
      Programming Interface
      D07005  0001
      WCU #06 NOT RESPONDING
.....
      F1              F2              F3              F4
  
```

After polling all 30 WCUs, the DEP-100S goes back to the first WCU identified on the network. It asks each control to upload the weld data stored in that control: the function list, set-up parameters, weld schedule #1 and the stepper data programmed.

### *Polling Completed*

When the DEP-100S completes its polling, it displays the weld data uploaded from the first WCU on the network.

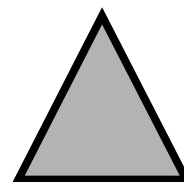
The Weld Data display shows the following information from the last weld completed at that weld control:

HHT #200				COMM ON	
.....					
	LINE(V)	SEC(I)	P.F.	C-FACTOR: 000	
MAX	000	00000	00	00%	L.V. 000
AVG	000	00000	00	00CYC	sch. #00
LOW	000	00000	00	00	WCU #00*
.....					
	F1	F2	F3	F4	

### **Caution:**



*This display shows the weld history for the last weld executed. If repetitive welds are made with different schedules, that weld data could be overwritten if the schedule displayed is not the last one initiated.*



# Program Mode

2

Program Mode is used to see or change the weld schedule, stepper and set-up parameters for a weld control. You can also reload the default values stored in the weld control, assign an alphanumeric ID to a weld control, or transfer weld data.

When you press the PROGRAM MODE key, you'll see the following display:

HHT #200

COMM ON

.....

- PROGRAM MODE -

REVIEW SCHEDULE

REVIEW STEPPER

REVIEW SETUP

RELOAD DEFLT \*

.....

F1

F2

F3

F4

The Program Mode display tells you the options you can select when you press the corresponding key, **F1** through **F5**:

REVIEW  
SCHEDULE:

**F1** lets you add or delete functions from a weld schedule, or change the values programmed for a function. (For more information, see "Review Schedule" on page 2-3.)

REVIEW  
STEPPER:

**F2** displays the stepper type and stepper parameters or profile for a weld schedule.(For more information, see "Review Stepper" on page 2-7.)

**REVIEW  
SETUP:**

**F3** shows the control's programmable set-up parameters. (For more information, see "Review Set-up Parameters" on page 2-12.)

**RELOAD  
DEFLT:**

**F4** reloads the factory-set default values. (For more information, see "Reload Defaults" on page 2-14.)

When you press **F5**, you'll see the additional functions:

**WELDER ID:**

**F1** lets you assign a four digit alphanumeric ID code to a weld control. (For more information, see "MedLAN Welder ID" on page 2-15.)

**TRANSFER  
DATA:**

**F2** transfers data between weld devices or between a device and WTC's host device (called the Weld Support System). (For more information, see "Transfer Data" on page 2-16.)

**NETWORK  
ADDR:**

**F3** lets you identify the device's unique MedLAN address. (For more information, see "Network Address" on page 2-18.)

# Review Schedule

. . . . .

The Review Schedule function is used to program a weld schedule by adding or deleting functions, or by changing the value programmed for a function.

When you press **[F1]** from the Program Mode display, you'll see weld schedule #1 for the device selected.

HHT #200		COMM ON	
.....			
S T A R T   O F   S C H E D U L E			
_TURN ON WELD IN PROGRESS			
TURN ON ISOLATION CONTACTOR			
wcu #15	sch #01	download	exit
.....			
F1	F2	F3	F4

In this example, the display shows the start of weld schedule #1 (sch #01) for wcu #15. The options on this display select the following features:

- Press **[F1]** to change the WCU selected.  
  
For example, to see WCU #10, press **[F1]** and then use the number keys to enter 10. When you press **[Enter]**, you'll see schedule #01 for WCU #10.
- Press **[F2]** to change the schedule number displayed.
- Press **[F3]** to download the new weld schedule data to the weld control selected.
- Press **[F4]** to return to the Program Mode.

When you see the weld schedule you want to edit, use the **[↑]** and **[↓]** keys to see all of the functions in a weld schedule.

When you see the message **END OF SCHEDULE**, you have seen all of the functions in that schedule. Press the **[↓]** key again to move back to the **START OF SCHEDULE**.

The DEP-100S can display only three weld functions at a time. (The last line is reserved to define the soft keys.) As you scroll through the schedule, the cursor remains to the left of the *second* line of the display.

## Program a Weld Schedule



. . . . .

When a weld schedule is displayed, you can insert or delete a function into the schedule, or change the programmable values for a function.

You can only change the weld schedules for the *selected* weld control unit. Make certain the correct WCU is selected and the correct weld schedule for that WCU is displayed before you make any programming changes.

### INSERT A FUNCTION




The INSERT key adds a weld function to a schedule. The new function is inserted *below* the line where the cursor appears.





1. Use the  and  keys to move the cursor
2. Press INSERT
3. The display prompts you, asking for the function you want to insert.



There are two ways to insert a function

- Select Function Type
- Enter Function Code

#### *Select Function Type (Using Function Keys):*

If you do not know the number of the function you want to insert, you can use a function key ( delay,  weld or  special functions) to move through the function list.

For example, pressing , shows a list of delay functions. These functions all tell the weld timer to wait without providing weld current. Now use the  and  keys to move through the list of delay functions. Press  when the cursor is next to the function you want to insert.

When you press , the function is inserted into the weld sequence with the cursor under the first programmable value for the function. Enter the number of cycles to delay and press  again.



**Note:**

*The list of functions available will depend on the software in the appropriate weld control unit (wcu). Refer to the Operator's Manual provided for the weld device to determine the list of functions and their 2-digit codes.*

*Enter Function Code:*

If you know the 2-digit function code assigned to a function, type the function number and press **Enter**. The function is displayed in the schedule with the cursor under the first programmable value for that function.

When you insert a weld function, you can program both the number of cycles to weld and the amount of heat to apply during the weld cycles. The cursor is under the number of cycles (the first value).

Use the numeric keys to enter the number of cycles to weld, then press **Enter**. The cursor moves to the weld heat value. Enter the % heat, and press **Enter** again.

## DELETE A FUNCTION FROM A SCHEDULE

To delete a function from a sequence, use the **↑** and **↓** keys to scroll the weld sequence until the cursor is next to the function you want to delete.

Now press **DELETE** and the function is removed.

## CHANGE FUNCTION VALUES

To change the values programmed for a function, use the **↑** and **↓** keys to scroll the schedule until the cursor is next to the function you want to change.

Now press the **→** and **←** keys to move the cursor to the value you want to change. When the blinking cursor is on the value, use the number keys to enter the new value and press **Enter**.

## DOWNLOAD NEW

### DATA

The changes you make to a weld schedule at the DEP-100S do not take effect at the weld control *until* you download the new weld data to the WCU.

When you are done programming, press **F3** to send the new data to the device. At the prompt that appears, enter the number of the WCU you want to receive the new data, and press **Enter**.

---

*This allows you to copy a schedule to a different device, or to another schedule within the same device.*

---

Use the numeric keys to select the WCU to receive the new data and press **Enter**. The prompt message now asks which schedule you want to download to the WCU. Use the numeric keys to enter the schedule you want to download and press **Enter**.

- To exit without downloading data, press **F4**.

# Review Stepper

. . . . .

WTC provides two types of steppers: both are used to assure consistent heat to each weld (despite mushrooming and alloying of the electrode tips). The method used to compensate for lost current density varies:

- The LINEAR stepper keeps track of the weld count, and gradually increases the heat after a programmed number of welds. Heat is added in several “steps” until the programmed set-point where the electrodes must be filed or replaced and the stepper reset. (See page 2-8.)
- The SUREWELD stepper monitors the power factor during each cycle of a weld and calculates the point where expulsion is expected to occur. The SureWeld stepper uses this calculation to continually supply weld current at a level just below the point of expulsion. (See page 2-10.)

## Note:




---

*Not every weld control supports the SureWeld stepper. The display does **not** show the SureWeld stepper options when the weld control software does not support these features.*

---

Some weld controls provide multiple independent steppers. Each weld schedule can be assigned to a stepper, and you can define a different profile for each stepper. (The profile tells the control when and how compensation is provided.)

You program the stepper settings for each weld control using the Review Stepper function (**[F2]**) on the Program Mode display, to:

- Review a linear stepper profile
- Review the current limits for the linear stepper
- Review the SureWeld stepper parameter settings
- Assign a stepper to a weld schedule

**Note:**

*The Review Stepper function is used only to program the stepper profile or stepper parameters. To advance, reset, or turn on or off a stepper, use the Stepper Status display, described on page 4-2.*

The stepper settings determine when current is added and the amount of current to add. When you select REVIEW STEPPER, you'll see a menu to program the stepper settings.

HHT #200		COMM ON	
.....			
1) Review Linear Stepper			
2) Review SureWeld Stepper			
.....			
F1	F2	F3	F4

**Note:**

*If the weld control does not provide a SureWeld stepper, option #2 does not appear on the Review Stepper menu.*

Use the number keys to select the stepper type you want to review. Press **[1]** or **[2]** to select a stepper option. Each option is described in the following sections.

## REVIEW LINEAR STEPPER

When you press **[1]**, you'll see the linear stepper profile that was defined for the selected WCU. (An example display, for stepper #01 of wcu #00, is shown below.)

HHT #200		COMM ON	
.....			
S T A R T   O F   S T E P P E R			
_STEP #01	+02 %	+0150 AMPS	0050 WELDS
STEP #02	+03 %	+0150 AMPS	0100 WELDS
wcu #00	stpr #01	download	exit
.....			
F1	F2	F3	F4

This display shows the amount of energy to add to the weld function during each step of the stepper profile (either % heat or secondary current, based on the firing mode used by the weld function executed).

Weld energy is added by the linear stepper over the 10 steps in the profile, in increments of 1%. The amount of weld energy added *or* subtracted is determined by the weld count and the values programmed in the stepper profile.

For example, the sample display shows that in step #1, the control will 2% heat to the base heat (programmed in the weld function) over the course of 50 welds. (It will add 1% after 25 welds, and 2% by the 50th weld.)

### Note:






---






*If the weld function used the constant current firing mode (rather than automatic voltage compensation), the device would instead add 150 amps of secondary current to the base amps (programmed in the weld function) over the course of 50 welds.*

---

The stepper allows you to add *or* subtract energy by selecting the polarity in this display. Change the polarity (+ or -) by moving the cursor to the + or - sign in front of the value and press ENTER. (This allows you to set the stepper for set-up or other applications that would require the stepper to step the heat up or down.)

### Changing a Stepper Profile

Programming the stepper profile display is similar to programming a weld schedule. The  and  keys move the cursor to each step. When the cursor is displayed on the step you want to change, you can change the settings.

- To change any of the stepper profile values, use the  and  keys to move the cursor to the value you want to change. Use the number keys to enter the new value and press .
- To select a different weld control for display, press  and enter the new wcu # number.
- To select a different stepper number for display, press  and enter the new stpr #.

- To download your changes to the weld control, press **F3**. (Changes must be downloaded to take effect.)
  - Enter the WCU number to receive the new data and press **Enter**. (The control prompts you to enter the stepper number you want to receive the new data.)
  - Press the stepper number to receive the new data and press **Enter**.
- To exit without changing any data at the WCU and to return to the Review Stepper menu, press **F4**.

## REVIEW SUREWELD STEPPER

The SureWeld stepper uses the weld control's ability to accurately measure the power factor during every cycle of the weld, rather than arbitrarily adding heat at a programmed weld count set-point.

The control uses the power factor to calculate whether expulsion occurred at any point during the weld, and to maintain current at a point just below expulsion.

If the control detects expulsion for a preset number of welds, the stepper automatically *decreases* the step heat. If the control does not detect expulsion for a preset number of welds, it automatically *increases* step heat.

The SureWeld stepper seeks the percent which will cause expulsion, then backs off the heat. The stepper uses real data accumulated over a number of welds to determine when heat adjustments are required.

The stepper uses the actual secondary current read during the last weld, and compares it to an exponential or running average of the last few welds executed by a weld schedule. This running average is used to determine high and low current conditions and deviation from a current window.

If you select the SureWeld stepper (in the set-up parameters), you must program a series of parameters to tell the weld control how to correctly calculate factors such as the point of expulsion.

You'll use the Review SureWeld Stepper display to review or program these unique parameter.

**Note:**

*(This manual does not describe or define the SureWeld parameters. Refer to the **Operator's Manual** provided with your weld control unit for more information on these parameters and how they impact stepper operation.)*

### Changing the SureWeld Stepper Profile

When you press **[2]** on the number keypad to select the Review SureWeld Stepper, a display similar to the one below allows you to program the values for the SureWeld Stepper:

HHT #200 COMM ON

.....

S T A R T   O F   S T E P P E R

\_INC HT/I ON 99 WELDS W/O EXPULSION

DEC HT/I ON 9 WELDS WITH EXPULSION

wcu #00   stpr #01   download   exit

.....

F1
F2
F3
F4

Programming these values is similar to programming a weld schedule: use the **[↑]** and **[↓]** keys to select the parameter you want to change. When the cursor is on the correct parameter is parameter, you can change the setting by entering the new value and pressing **[Enter]**.

- To select a different weld control for display, press **[F1]** and enter the new wcu # number.
- To select a different stepper number for display, press **[F2]** and enter the new stpr #.
- To download your changes to the weld control, press **[F3]**. (Changes must be downloaded to take effect.)
  - Enter the WCU number to receive the new data and press **[Enter]**. The prompt asks you to enter the number of the stepper you want to receive the new data.
  - Enter the correct stepper number and press **[Enter]**.
- To exit without changing data at the WCU and to return to the Review Stepper menu, press **[F4]**.

# Review Set-up Parameters

. . . . .

WTC weld controls use a number of programmable settings, called set-up parameters, to enable you to customize a weld control to meet your application requirements.

The set-up parameters tell the control about its operating environment: how to react to certain conditions (as FAULT or ALERT conditions), the hardware used (such as the type of transformer and the transformer turns ratio), the range of primary and secondary current to expect and how to react when certain inputs become active.

Every device has a unique set of parameters. Refer to the Operator's Manual provided with the weld device for more information.

## Warning!



---

*The weld device will ignore changes to certain set-up parameters (such as those controlling retract operation) until power to the device is cycled (turned off and then back on).*

*Because these settings control operation of the weld device, extreme care should be exercised before making changes to set-up parameters!*

---

## CHANGING PARAMETER SETTINGS

When you press **[F3]** from the Program Mode display menu, you're selecting the Review Setup display, which is used to see or change the current settings for a weld control's set-up parameters.



You'll use a display similar to the one below to review the parameter settings.

HHT #200		COMM ON	
.....			
S T A R T   O F   S E T - U P			
_INVALID SEQUENCE SELECTED: (FAULT)			
WELD INITIATE NOT PRESENT: (ALERT)			
wcu #00	download	exit	
.....			
F1	F2	F3	F4

The last line of the display tells you that you can press **F1** to see parameters for another weld control or download the new settings to a weld control by pressing **F3**. (To return to the Program Mode display, press **F4**.)

To change the set-up parameters for the selected control, use the **↑** and **↓** keys to move the cursor to the parameter you want to change.

- If the parameter is a word, press the **←** or **→** key to change the selection. Press these keys until you see the correct parameter status.
- If the parameter is a number (such as HIGH CURRENT LIMIT: nnn0), press **Enter**, enter the new value and press **Enter** again.

## DOWNLOAD PARAMETER SETTINGS

When you have defined all of the set-up parameters, press **F3** to download your changes to the WCU.

Select the weld control you want to receive the data and press **Enter**. (You can download the same parameter settings to more than one weld control.)

The new parameter settings do not take effect *at the weld control* until you download your changes.

# Reload Defaults

. . . . .

Each control stores default values for every programmable setting. These values (stored in the EPROM in the weld control) are the ones the WCU will use until the settings are changed, either through the WCU programming panel or using the DEP-100S .

The Reload Defaults option allows you to reset the control to a “known” condition. When you reload the default values, the stepper, set-up parameters and all of the weld schedules revert to their default values.

When you press **[F4]** on the Program Mode display, you’ll see a prompt asking you to enter the number of the weld device you want to reload. Select the WCU number and then press **[Enter]**.

## Note:



*If the weld control stores more than one version of defaults (such as for a robot, machine, seam, spot, or portable gun), you may see another menu, asking you to select which set of default you want to reload. Select from the menu and press **[Enter↵]**.*

## LOAD DEFAULT

When you press **[Enter]**, you’ll see the following warning, to alert you that reloading the default settings will erase all of the programming changes made from the DEP-100S , and reset all programmable values to those stored in the EPROM.

HHT #200 COMM ON

.....

\*\*\*\*\* WARNING \*\*\*\*\*

ALL PROGRAMMED DATA WILL BE OVERWRITTEN

CONTINUE ABORT

.....

F1
F2
F3
F4

- If you want to Continue, press **[F1]**. The system reloads the selected WCU from EPROM memory, then returns you to the Program Mode display.

- If you do not want to reload, press **[F4]** to return to the Program Mode display without reloading a weld control's defaults.

**Caution:**



*After reloading default values, you should review all of the set-up parameter settings, stepper profile values and weld schedule data before attempting to initiate a new weld.*

## MedLAN Welder ID

. . . . .

The Welder ID option enables you to assign a 4-digit alphanumeric code to a weld control. This can be used to correlate a control's MedLAN address to a plant-wide numbering system.

When you press **[F5]** on the Program Mode display you'll see the following display.

HHT #200		COMM ON	
.....			
- PROGRAM MODE -			
WELDER ID	TRANSFER DATA	NETWORK ADDR	
.....			
F1	F2	F3	F4

(This display shows the additional functions available from the Program Mode display.) From here, press **[F1]** to program the Welder ID.

**Note:**



*Not every weld control supports the welder ID feature. If it is unavailable, the option is not displayed. When it is available, the ID number is shown on the following display.*

HHT #200 COMM ON

.....

use the up/down cursor keys to change

ID#8 8

^

wcu #00 download exit

.....

F1 F2 F3 F4

As the display indicates, the and keys change the character displayed above the cursor (shown as ^). Press to select an alphanumeric character or the period sign (.) .

When the correct letter or number is displayed, press or to move the cursor to the next ID# position.

When you have entered the welder ID number, you have the following options:

- To change the selected WCU, press , enter the number of the WCU and press .
- To download your changes to the selected WCU, press .
- To exit, press .

## Transfer Data

.....

The Transfer Data option allows you to transfer data between weld devices. If your site is using WTC's Weld Support System (WSS) as a host device, the Transfer Data display will enable you to transfer data between a WCU and the host.

When you press **F5** on the Program Mode display, you can then press **F2** to select the Transfer Data display, shown below.

```

HHT #200                                COMM ON
.....
(1) WCU TO HOST TRANSFER
(2) HOST TO WCU TRANSFER
(3) WCU TO WCU TRANSFER
.....
      F1              F2              F3              F4
  
```

Use the number keys to select an option.

### Note:



*Options 1 and 2 are designed for use with WTC's Weld Support System (WSS) as your user interface. (The host device is the WSS.)*

If you select **3** (WCU to WCU transfer), you're telling the control that you want to copy data between devices. This allows you to upload data from one device, then download it to a second device.

You'll use the following display to indicate which data to copy between devices:

```

HHT #200                                COMM ON
.....
(1) COPY SCHEDULE DATA
(2) COPY STEPPER DATA
(3) COPY ALL DATA
.....
      F1              F2              F3              F4
  
```

When you select an option from this menu (**1**, **2**, or **3** and **Enter**), you'll see a prompt asking you to enter the number of the weld control you want to copy *from*.

- Enter the number and press **Enter**. The prompt now asks you to enter the number of the weld control you want to *receive* the data.
- Enter the number of the device you want to receive the data and press **Enter**.

- You can now copy data to another weld control, or press **F4** to return to the Program Mode display.

## Network Address

. . . . .

This option is used to identify the device's MedLAN address.

### Note:



*(Some devices require that the MedLAN address be specified by setting jumpers within the control. Refer to the **Operator's Manual** provided with your device for more information on its MedLAN address.)*

This option is not supported in every release of the DEP-100S software. If it is not supported, the option does not appear on the Program Mode display.

When you select the network address option from the Program Mode (using **F5** and then **F4**), you'll use the following display:

HHT #200

COMM ON

.....

NETWORK ADDRESS PROGRAMMING

port #nn

download

exit

.....

F1

F2

F3

F4

Press **F1** to select the port number. (This is the MedLAN address, selecting a channel between 0 and 29.)

Enter the port number and press **Enter**. Now press **F3** to download the address to the weld device.

When you are finished (or to leave without entering a network address), press **F4**.

**Caution:**



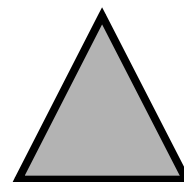
---

*Every device must have a unique address on the network.*

---

Program Mode





# Display Mode

3

Display Mode enables you to perform the following tasks to change a weld schedule:

- To access a schedule's welding data such as line voltage, primary and secondary current and power factor.
- To adjust the squeeze, weld current, and hold times for a schedule
- To adjust the current for a stepper.
- To change a WCU status to Weld or No Weld.

When you press the **DISPLAY MODE** key, you'll see the following display:

HHT #200		COMM ON	
.....			
DISPLAY MODE			
WELD	HEAT	W/NW	
DATA	DISPLAY	STATUS	
.....			
F1	F2	F3	F4

## WELD DATA:

Press **F1** to see the status of the last weld initiated by the device selected. (See page 3-2.)

## HEAT DISPLAY:

Press **F2** to change the amount of weld energy provided by a schedule without using Program Mode. (See page 3-4.)

**W/NW STATUS:** Press **[F3]** to enable or disable the firing pulses to the WCU selected. (This is a software No Weld, rather than a hard-wired switch on the weld control enclosure. (See page 3-6.)

## Weld Data

. . . . .

The Weld Data display shows the status of certain key weld parameters. These include the schedule initiated, line voltage, power factor and secondary current provided during the last weld executed by the selected weld control.

The DEP-100S shows the Weld Data display after its power up displays. However, you can request this display at any time by pressing the **DISPLAY MODE** key and then **[F1]** (to select the **WELD DATA** option).)

HHT #200					COMM ON		
.....							
	PriV	SecI	PF	KVAT	00000	CFACT	000
MAX	000	00000	00	00 %		L.V.	000
AVG	000	00000	00	00 CYC		sch.	#00
LOW	000	00000	00			WCU	#00*
.....							
F1		F2		F3		F4	

This display shows the weld history for the selected schedule of the selected device. You can select another schedule by pressing **[F5]**. (Remember that the \* on the Weld Data display means that there are additional options available under **[F5]**).

When you press **[F5]**, the last line of the display is replaced by a prompt asking you to enter a schedule number (or 00 to select every schedule):

Enter the schedule number you want monitored and press **[Enter]**. This will display the weld results for one schedule. To resume normal weld monitoring, enter schedule #00.

## Weld Data Descriptions

<b>MAX AVG LOW</b>	These three rows indicate the maximum, average and minimum values read during the last weld.
<b>PriV</b>	This column shows the primary line voltage detected by the WCU during the weld.
<b>SecI</b>	This column shows the secondary current (I) read during the last weld.
<b>PF</b>	The third column is the maximum, average, and minimum power factor during the last weld.
<b>KVAT</b>	<p>This value represents the actual power delivered to a weld. It is computed by the equation:</p> $V_p \times I_p \times Cycles / 1000 = KVAT$ <p>Where:  V<sub>p</sub> (average primary voltage)  I<sub>p</sub> (average primary current)  Cycles (# of cycles weld current)</p>
<b>CFACT</b>	<p>C-Factor is 1% of the total available current. The C-Factor is re-calculated for each weld. (This value is the amount of actual secondary current that will be added to the total weld energy for each 1% of current.)</p> $\frac{I_{sec}}{\%I} = C - Factor$ <p>This value is used to alert the maintenance staff of a welder's deteriorating secondary or shunting conditions.</p>
<b>00% I 00 CYC</b>	These two values show the percent current (00 % I) and number of cycles (00 CYC) of weld current provided during the last weld.
<b>L.V. 000</b>	The line voltage at the WCU. This is updated each time the DEP-100S polls the WCU.
<b>sch #00</b>	The last schedule initiated by the selected WCU.
<b>WCU #00</b>	The selected weld control.

The DEP-100S always displays data for the *selected* WCU. To see a different device, press **[F4]**. Press **[F5]** to see a different device.

**Note:**



*The display you see may vary based on the WCU selected. For example, if your WCU does not calculate KVAT, you will not see the KVAT values. Similarly, previous versions of the DEP-100S software show primary voltage as LINE(V) and primary current as SEC(I).*

## Heat Display

. . . . .

The Heat Display is used to adjust the cycle times for certain functions (such as squeeze, weld and hold) and the amount of weld energy, without changing the weld schedule (in Program Mode). This lets you experiment with different weld times and heats, to weld a series of test coupons.

When you press **[F2]** for HEAT DISPLAY, the DEP-100S displays these functions from the selected weld schedule using an abbreviated format.



A sample Heat Display (for a dual-pulse weld) is shown below.




HHT #200		COMM ON	
.....			
ID#8080	SQUZ99	WLD08C/20%	HOLD05
.....			
wcu #00	sch #01	download	
.....			
F1	F2	F3	F4

This shows that schedule #1 of weld device #00 provides 99 cycles of squeeze (SQUZ) time, then weld for 8 cycles at 20% heat using automatic voltage compensation firing mode and finally hold for 5 cycles.

The following table shows the functions that are included in the current display, and how they are abbreviated.

Code	Function	Abbreviation
01	SQUEEZE 00 CYCLES	SQUZ00
02	COOL 00 CYCLES	COOL00
03	HOLD 00 CYCLES	HOLD00
04	WAIT 00 CYCLES	WAIT00
20	WELD 00 CY. 00% HEAT	WLD00C/00%
21-24	(other weld functions)	WLD00C/00%
30-34	WELD 00 CY. 00000 AMPS	WLC00C/00000 A
40	SLOPE 00 CY. 00% TO 00%	SLP00C/00%-00%
4	TURN ON VALVE #n	OUT1:n
55	TURN OFF VALVE #n	OUT0:n
60	IMPULSE =00 HEAT CY 00 COOL CY	IMP=00HT 00CL
62	REPEAT AT NEXT FUNCTION	RPT
74	WELD 000 IMP. 00% HIGH 00% LOW	WLD000I/00%HI 00%LO

If the weld schedule requires more than three lines to display the selected functions, use the  and  keys to see additional functions.

- To select a different weld control, press , and enter the number of the WCU you want to see.
- To select a different weld schedule to display, press  and enter the number of the schedule you want to see.
- To download the changes you made to the weld function(s) to the selected WCU and weld schedule, press .

**Note:**

*You must download your changes before they take effect at the weld control.*

## Weld/No Weld Status

. . . . .

The W/NW Status display lets you select either weld or no weld mode for a device. This is a *software* setting (rather than using a hardware No Weld switch on the weld control enclosure.)

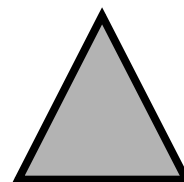
This display enables you to select WELD MODE or NO WELD MODE for each weld control from the DEP-100S, rather than from the I/O.

When you press **[F3]** to select this display, you'll see a display similar to the one below.

HHT #200		COMM ON	
.....			
Toggle Weld/No Weld Mode			
MODE: WELD MODE			
WCU #00	TOGGLE	EXIT	
.....			
F1	F2	F3	F4

In the sample display shown above, the selected WCU (#00) is in WELD MODE.

- To change the weld mode, press **[F2]** (TOGGLE), and the selection changes. (Each time you press **[F2]**, the display shows the new weld status: WELD MODE or NO WELD MODE).
- To see a different weld control, press **[F1]** and enter the new WCU number and then press **[Enter]**.
- To exit the W/NW Status display, press **[F4]**.



# Status Mode

4

Use the Status Mode to see overall welding status information about:

- The linear or SureWeld stepper.
- The serial input or output for a weld control.
- The fault or alert conditions for a control's set-up parameters.
- The network communications (between the DEP-100S and the weld control).
- The hardware and software revision numbers for the DEP-100S and weld control.

When you press the **STATUS MODE** key, you'll see the following display:

HHT #200		COMM ON	
.....			
STATUS MODE			
STEPPER	I/O	FAULT	NETWORK
STATUS	STATUS	STATUS	STATUS *
.....			
F1	F2	F3	F4

The Status Mode display tells you the options you can select when you press the corresponding keys (**F1** – **F5**).

## STEPPER STATUS

Press **F1** to control the stepper. You can turn a stepper on or off, reset, or advance the stepper from this display. (See page 4-2.)

## I/O STATUS

Press **F2** to see the current state of the I/O for a selected device. (1=on, 0=off). (See page 4-6.)

#### FAULT STATUS

Press **F3** to see the fault information logged at the WCU, to determine which WCU and fault condition caused the fault or alert. (See page 4-7.)

#### NETWORK STATUS

Press **F4** to see a running count of the communication errors between the DEP-100S and the weld control. This display is provided to troubleshoot the MEDLAN network. (See page 4-11.)

#### REVISION STATUS

Press **F5** and then **F1** to display the revision level numbers for the software used by the DEP-100S and the weld control unit.

#### HARDWARE STATUS

Press **F5** and then **F2** to display the software program and hardware version numbers for the central processing unit (CPU) and network node adaptor (NA) of a DEP-100S.

## Stepper Status

. . . . .

Press **F1** to see the status of each stepper, to turn the stepper on or off, to advance the stepper (by changing the weld count), or to reset the stepper.

#### Note:



*The Stepper Status display cannot be used to program the linear stepper profile or the SureWeld stepper parameters. To do this, you must press the **PROGRAM MODE** key and press **F2** for the Review Stepper menu. (For more information, see “Review Stepper” on page 2-7.)*

The information shown in the Stepper Status display is based on the stepper used by the schedule selected for a device.

### LINEAR STEPPER STATUS DISPLAY

If you defined the stepper as a linear stepper on the Review Stepper menu described in “Review Stepper” on page 2-7, press **F1** and you’ll see a display similar to the one on the next page.



**Note:**

*This display will function differently, based on the software revision contained in the weld control unit. Refer to the **Operator's Manual** provided with the weld control for more complete information on the stepper operation and programming.:*

```







HHT #200                                COMM ON
.....
LINEAR STEPPER STATUS
_BOOST: +00%                            Total Welds=00000
Step #01                               Step Count=0000
stpr #01      on      advance      wcu #00*
.....
      F1              F2              F3              F4

```

The stepper displays weld heat as secondary current if the last weld function executed used constant current compensation, or as % heat if the weld function used automatic voltage compensation.

### *Linear Stepper Status Description*

The Linear Stepper Status display shows the following information about the stepper:

<b>Boost: + 02%</b>	This is the heat that will be provided to the next weld: +02% is the heat added by the linear stepper, based on the step profile, to the weld functions.
<b>Total Welds= 00000</b>	This field is the total number of welds initiated since the stepper was last reset.
<b>Step #01</b>	This field is how far the stepper has progressed through the step profile (the number of steps is determined by the weld control). You can advance the stepper by changing this value: press the  key, enter a number and press  . (Or press  twice.)
<b>Step Count=0000</b>	This field shows the number of welds initiated during this step. You can also advance the stepper to another step by changing this value: Press  , enter a number and press  . (Or press  twice.)
<b>Total Welds: 00000</b>	This field is the total number of welds initiated since the stepper was last reset.

The last line of the display shows the WCU selected and lists the selected stepper, whether the stepper is ON or OFF and how to reset the stepper.

- To change the stepper selected (stpr #01), press **[F1]**, enter a new stepper number and press **[Enter]** or an arrow key.
- To turn the stepper ON or OFF (enable or disable the linear stepper), press **[F2]**. The display toggles between ON and OFF.
- To advance the stepper, press **[F3]** and the **[→]** key. (The step number is advanced to the next step, and the step weld count is reset to zero.)

If the stepper is on step #5, the stepper is reset to step #1, total weld count 0 when this key is pressed.

**Note:**



*When you press this key, you're asked if you want to download and save the data that was changed by the DEP-100S. Press **[F1]** to answer no (and ignore your changes) or **[F3]** to send the new data to the weld control.*

- To change the selected weld control (wcu #00), press **[F4]**, enter a WCU number, and press **[Enter]** or an arrow key.

(For more information, see "Review Linear Stepper" on page 2-8.)





## SUREWELD STEPPER STATUS DISPLAY

If the selected weld control is defined as a SureWeld stepper, press **[2]** and you'll see a display similar to the one shown below:








```

HHT #200                                COMM ON
.....
SURE STEPPER STATUS: Max 1 Cy Drop 00.00
_Bboost: +00%                          Total Welds=00000
UT=00 DT=00                          No Exp=00   Exp=00
stpr #01      off      reset      wcu #00
.....
      F1              F2              F3              F4
    
```

*SureWeld Stepper Status Description*

<b>Max 1 Cy Drop 00.00</b>	This field is the highest 1-cycle drop in power factor during the last weld. If no drop was detected, then this display would show asterisks instead of a value (**. **).
<b>Boost: +00%</b>	The Boost field is the heat that will be added to the next weld: (+00% is the heat added by the SureWeld stepper). You can change the percentage, by pressing the  key, enter a new percentage of heat or current, and press  . You can also use the  or  key to increase or decrease the value.
<b>Total Welds=00000</b>	The number of welds initiated that were controlled by this stepper since this stepper was last reset.
<b>UT=00, DT=00</b>	These fields show the status of the Up Trend (UT) and Down Trend (DT). At least one of these numbers will be zero.
<b>No Exp=00</b>	The <b>No Exp</b> field is the number of no expulsion welds made since the stepper last increased (or decreased) weld current. When this counter reaches the limit programmed in the stepper profile (INC HT ON 00 WELDS W/O EXPULSION), the stepper increases the heat by 1%.
<b>Exp=00</b>	The <b>Exp</b> field is the number of expulsion welds made since the stepper last increased (or decreased) weld current. When this counter reaches the limit programmed in the stepper profile (DEC HT ON 0 WELDS WITH EXPULSION), the stepper decreases the heat by 1%.

The last line of the display lists the options assigned to the “soft” function keys:

- To change the stepper selected, press , enter a new stepper number, and press . (You can also increase or decrease the stepper number with the  and  keys.)
- To turn the stepper ON or OFF (enable or disable the stepper), press . The display toggles between ON and OFF.
- To reset the stepper (after filing or replacing the electrode tips), press the  and  keys. (The weld count, expulsion and no expulsion counters are all reset to zero. The current is loaded from the INITIAL CURRENT value programmed in the SureWeld stepper parameters.)

- To change the selected weld control, press **[F4]**, enter a WCU number, and press **[Enter]**. (You can also increase or decrease the stepper number with the **[↑]** and **[↓]** keys.)

For more details, see “Review SureWeld Stepper” on page 2-10.

## I/O Status

• • • • • • • • • •

Press **[F2]** to see the state of the I/O for a selected device. This display allows you to monitor the status of the I/O for all of the weld controls (WCUs) from the DEP-100S.

### Note:



*The display shows a **1** if the input or output is **active**, or a **0** if the input or output is inactive.*

The display uses abbreviations to show the state of the inputs and outputs, as shown below:

HHT #200						COMM ON	
.....							
I / O				S T A T U S			
FS2	FS3	FS4	FS5	PTY	A2		
0	0	0	0	0	0		
						WCU #00	
.....							
F1		F2		F3		F4	

This display will vary, based in the I/O provided with the weld control unit.

### Note:



*Refer to the **Operator’s Manual** provided with the weld control for more information on I/O definition, and the abbreviations used.*

- To see the additional inputs and outputs, press the **[↑]** and **[↓]** keys.
- To select a different device, press **[F4]**, enter the WCU number and press **[Enter]**.

# Fault Status

. . . . .

Press **F3** from the Status Mode display to see the control's fault status.

## Note:



*This display is used to expand on the **FAULT** and **ALERT** indicators on the **DEP-100S**. To determine which fault condition was detected and the weld control where the fault was generated, press the **FAULT STATUS** key. Then select the appropriate display option.*

*The fault conditions are defined in the **Operator's Manual** provided with the weld control unit.*

When you press **F3**, the DEP-100S displays a menu to let you select how you want to categorize the fault status information:

HHT #200
COMM ON

DISPLAY ALL (1)
DISPLAY INDIV (4)

DISPLAY FAULTS (2)
DISPLAY WCU (5)

DISPLAY ALERTS (3)

select option

F1
F2
F3
F4

The options (1–5) let you select the type of information displayed, to show only the faults, only alerts, the faults at only one weld control (SCR) or to see all the WCUs that generated a fault.

Use the number keys to select an option and press **Enter**. Each option is defined in the following section.

## DISPLAY ALL

The Display All option shows a summary of the faults and alerts detected at *every* WCU. The display does not show which fault/alert condition was detected, but shows which weld control(s) generated either a fault or alert.

HHT #200		COMM ON	
.....			
FAULTS ON WCU #:		00	02 03 07 09
ALERTS ON WCU #:		00	02 03
.....			
F1	F2	F3	F4

As the sample display shows, WCUs #00, 02, 03, 07 and 09 have generated fault conditions. Alert conditions were detected at WCUs #00, 02 and 03.

- To clear all of the faults and alerts on all of the WCUs, press **[F2]**.
- To see additional WCUs, if the display shows **(more)**, press **[F3]**.
- To return to the Fault Status menu, press **[F4]**.

## DISPLAY FAULTS

The Display Faults option shows a list of any faults detected, followed by the number(s) of the WCU(s) that generated the fault condition.

HHT #200		COMM ON	
.....			
S T A R T   O F   F A U L T S			
LOW CURRENT LIMIT:		00	01 04 07
END OF STEPPER:		00	01
clear		(more)	
.....			
F1	F2	F3	F4

If no faults were detected, you'll see a message saying that no FAULTs were present. If there are more faults than can be displayed at one time, the display shows **(more)** as **[F3]**.

From the example shown on the previous page, WCUs #00 and 01 generated an END OF STEPPER Fault. The LOW CURRENT LIMIT Fault was detected at WCUs #00, 01, 04 and 07.

- To clear all faults on all the weld controls, press **[F2]**.
- To see additional WCUs where faults were detected, press **[F3]**.
- To return to the Fault Status menu, press **[F4]**.

## DISPLAY ALERTS

The Display Alerts option displays the *alert* conditions detected.

HHT #200		COMM ON	
.....			
S T A R T   O F   A L E R T S			
STEPPER APPROACHING MAX:		04	09
clear		menu	
.....			
F1	F2	F3	F4

If no alerts were detected, you'll see a message saying that no ALERTs were present. The display shows the type of alert, followed by a list of any weld controls generating an alert.

- To clear all of the alerts on all of the weld controls, press **[F2]**.
- To see additional controls where alerts were detected if the display shows **(more)**, press **[F3]**.
- To return to the Fault Status menu, press **[F4]**.

## DISPLAY INDIV

The Display Indiv option shows a list of all of the fault or alert conditions detected and the control(s) that generated it.

```

HHT #200                                COMM ON
.....
S T A R T      O F      F A U L T S
LOW CURRENT LIMIT:                00 01 04 07
STEPPER APPROACHING MAX:          04 09
                                clear                      menu
.....
                                F1                        F2                        F3                        F4
    
```

If no faults or alerts were detected, you'll see the message "NO FAULTS PRESENT."

- To clear all faults or alerts on all of the WCUs, press **F2**.
- To see additional WCUs where faults or alerts were detected, press **F3**.
- To return to the Fault Status menu, press **F4**.

## DISPLAY SCR

The Display SCR option displays only the faults or alerts detected at the selected SCR.

```

HHT #200                                COMM ON
.....
SCR  # 00    F A U L T S / A L E R T S
LOW CURRENT LIMIT:  (FAULT)
STEPPER APPROACHING MAX:  (ALERT)
wcu #00      clear                      menu
.....
                                F1                        F2                        F3                        F4
    
```

The display shows the type of fault or alert condition, and its status (as FAULT or ALERT), as defined in the set-up parameters.

- To clear all of the faults or alerts on the selected WCU, press **F2**.
- To select a different WCU for display, press **F1** and enter the new WCU number and press **Enter**.
- To return to the Fault Status menu, press **F4**.



# Network Status

. . . . .

The Network Status display shows the status of network communications between the DEP-100S and each weld control. When you press **[F4]** on the Status Mode menu, you will see a display similar to the one below:

HHT #200		COMM ON	
.....			
NETWORK STATUS:		DEP	WCU
Header Error 1 Lost Data		0000	0010
Invalid Command Received		0000	0000
STATUS	CLEAR	OPTIMIZE	WCU #00*
.....			
F1	F2	F3	F4

The **DEP-100S** and **WCU** columns are counters showing the number of times an event occurred. In the above example, the weld control logged the **Lost Data** error 10 times.

- To select another WCU for display, press **[F4]**, enter the WCU number and press **[Enter]**.
- To see the status of each weld control on the network, press **[F1]**. You'll see the following display:

HHT #200						COMM ON	
.....							
NETWORK	WCU	#00-03	0	1	1	1	
ON LINE	WCU	#04-07	0	0	0	0	
STATUS	WCU	#08-11	0	0	1	0	
(1=ON)	WCU	#12-15	0	0	0	0	EXIT*
.....							
F1		F2		F3		F4	

- The status display shows which of the weld controls are considered on-line or off-line by the DEP-100S. In the example shown, only WCUs #01, #02, and #10 are on-line (a 1 is shown) of the 16 WCUs displayed.
- To see the additional WCUs, press **[F5]**.

- To return to the Network Status display, press **F4**.

- To clear all of the network status counters, press **F2**.

**Caution:**



---

*This information is displayed as an aid to troubleshoot communications on the MedLAN network and should be cleared or reset **only** by qualified personnel. Refer to the appropriate MedLAN documentation for additional assistance.*

---

- To select the network polling option for Optimize or Monitor mode, press **F3**.
  - OPTIMIZE tells the network to poll *only* the WCUs that were on-line when you selected Optimize mode (or when the DEP-100S is reset). This speeds communications because the network does not wait for a response from inactive devices, and each WCU is polled more frequently.
  - MONITOR resumes normal polling (all the devices are polled).
- To display the revision numbers of all of the hardware and software, press **F5**. You'll see a new menu to select the Revision Status (**F1**) or the Hardware Status (**F2**).
  - Press **F1** to select revision status, and you'll see a display showing the hardware and software revision numbers of the DEP-100S and every WCU.
  - Press the **↓** key to see all of the WCUs on the network.
  - Press **F5** to return to the Status Mode display.
- To see the network status of additional conditions, press the **↑** and **↓** keys. The following briefly describes all of the error conditions on the network status display.

**Caution!**

*The presence of an error condition **does not** mean that communication did not take place. For example, if a message is not correctly verified (Checksum Error on Rec'd Command), the receiving station will try to read and verify the message 10 times. Each unsuccessful try will increment the counter displayed.*

## ERROR CONDITIONS

<b>Lost Data (buffer overflow)</b>	This error occurs at the weld control, to indicate that weld or fault data not requested by the master has been overwritten by new data.
<b>Invalid Command Received</b>	The weld control received an invalid command from the DEP-100S.
<b>Receive Buffer Overflow</b>	The receiving station lost a message during the last transmission.
<b>Cksum Error on Rcv'd Command</b>	The message from the transmitting station could not be verified on one attempt.
<b>Framing Error on Rcv'd Char</b>	A character received from the transmitting station was not in the proper frame format.
<b>Response Time Limit Exceeded</b>	The DEP-100S did not respond to a message from the weld control. It may mean that the weld control did not understand the transmission. (The DEP-100S re-transmits.)
<b>Inter-character Timeout</b>	The receiving station timed out after receiving a partial transmission of a message. (The message is re-transmitted.)
<b>Receiver Overrun Error</b>	More than three characters were received without a read by a station.

## VIEWING STATUS OF MULTIPLE HHTs

HHT program D07005 (or greater) permits connecting multiple HHTs on one network. An additional screen lets you view the status of the HHT(s) on the network. This screen is available under the Network Status option of the Status menu.

To access this screen, first press the Status Mode key. Press **[F4]** to open the Status menu. Then press **[F1]**. A display similar to the following appears:

HHT #200				COMM ON			
.....							
NETWORK	M2	#200-203	1	1	1	0	M1 1
ON LINE	M2	#204-207	0	0	0	0	
STATUS	M2	#208-211	0	0	0	0	
(1=ON)	M2	#212-215	0	0	0	0	EXIT*
.....							
F1		F2		F3		F4	

The first column reads, NETWORK ON LINE STATUS (1=ON). The next column displays either WCU (for the weld control unit), or M2 (for media access layer 2). M1 1 denotes that media access layer 1 is active.

The next column lists the MedLAN address(es) of the WCU(s) being reviewed. The example above shows the operating status for 16 WCUs on this network. They are designated WCU #200 – 215.

On each row of data, four digits follow. They can be either 0, or 1. 0 means that the corresponding HHT is not connected, or not active. 1 means that the respective HHT is connected and active.

In this example, HHT addresses #200, 201 and 202 are active. The other 13 HHTs are not active.

To exit this screen and return to the Status option of the Network Status menu, press **[F4]**.

If displayed, an asterisk ( \* ) following EXIT denotes that more status indications appear on one or more additional screen(s). Scroll through the additional screen(s) by pressing the **[F5]** key.

## Revision Status

. . . . .

Select this option (by pressing **[F5]** and then **[F1]**). This presents a display showing the software revision levels of both the DEP-100S and the weld control unit, for reference.

A typical display is shown below.

HHT #200		COMM ON	
.....			
D.E.P	D07005-72		
WCU #00	T93300-00-20		
.....			
F1	F2	F3	F4

From this display, press **[F5]** to return to the main Status Mode menu.

## Hardware Status

. . . . .

This display is similar to the Revision Status, but it shows the hardware revision levels:

HHT #200		COMM ON	
.....			
CPU	66636M1	SERIAL	88888888 NET ADDR 008
LCA	xper 2.8	SLC	04.07
PRGM	T93300-00-17-42-68		EXEC L666x-02-08
.....			
F1	F2	F3	F4

## Status Mode

This display is useful for determining your exact configuration when contacting WTC for service or technical support. It identifies the software revision levels, the ladder logic number and the network address number.

Press **F5** to return to the main Status Mode menu.