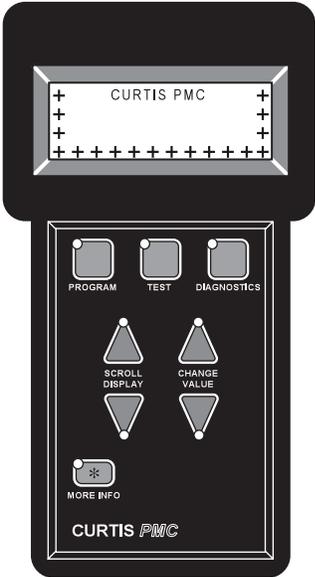


Curtis™ 1307, 1311

1307



1311



CURTIS PROGRAMMER MANUAL

Advance Model: 56409441(1307-old style / 1311-new style)

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CURTIS 1311 REPLACEMENT PARTS

56410507 – RJ11 Cable

56410508 – Molex Cable (4 pin)

CURTIS 1307 REPLACEMENT PARTS

56409823 – Molex Cable (4 pin)

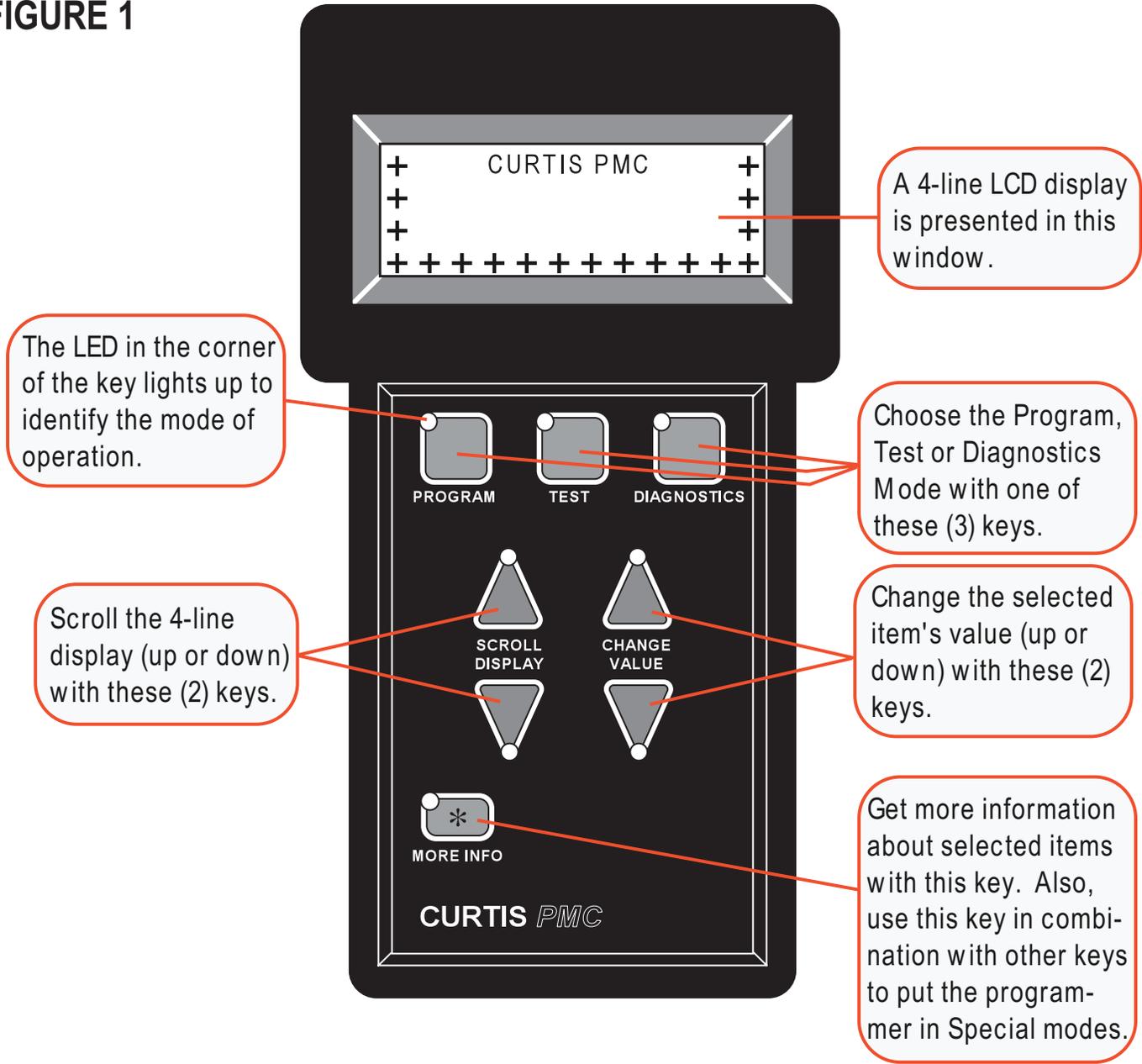
Uses standard RJ11 telephone handset cord

CURTIS 1307 PROGRAMMER

PROGRAMMER OPERATION

The optional universal Curtis PMC handheld programmer / **PART NUMBER 56409441** (Figure 1) allows you to program, test, and diagnose Curtis PMC controllers. The programmer is powered by the host controller, via a modular connector located in the front of the controller. When the programmer is first plugged into the controller, wait until the programmer has acquired all the controller parameters. When this step has

FIGURE 1



been completed, the programmer displays the controller's model number, date of manufacture and software revision code. Following this initial display, the programmer displays a prompt for further instructions.

PROGRAMMER OPERATION

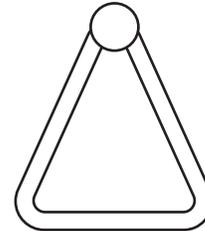
The programmer is operated via an 8-key keypad. Three keys select operating modes (Program, Test, Diagnostics), two scroll the display up and down, and two change the values of selected parameters. The eighth key, the MORE INFO key, is used to display further information about selected items within any of the three standard modes. In addition, when pressed together with the PROGRAM or the DIAGNOSTICS key, the MORE INFO key selects the Special Program mode or the Special Diagnostics mode.

The display window presents a 4-line LCD display. The display is visible even in bright sunlight. You can adjust the display contrast in the Special Program mode.

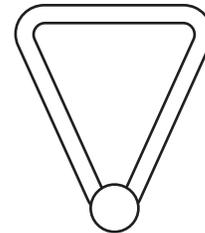
When one of the menu keys is pressed, the LED at the corner of the key lights up, identifying the mode of programmer operation. For example, if the TEST key is pressed, the LED at the corner of the key indicates that the programmer is now in the Test mode, and the Test Menu is displayed.

Four lines of a menu are displayed at a time. The item at the top of the display window is the selected item. To select an item, scroll within the menu until the desired item is positioned at the top of the display window. The selected item is always the top line. (In the Program mode, the selected item is highlighted by a flashing arrow). To modify a parameter or obtain more information about it, it must be scrolled to the top position in the display window.

To scroll up and down within a menu, use the two SCROLL DISPLAY arrow keys. The SCROLL DISPLAY arrow keys can be pressed repeatedly or be held down. When a key is held down, the scrolling speed increases the longer the key is held.

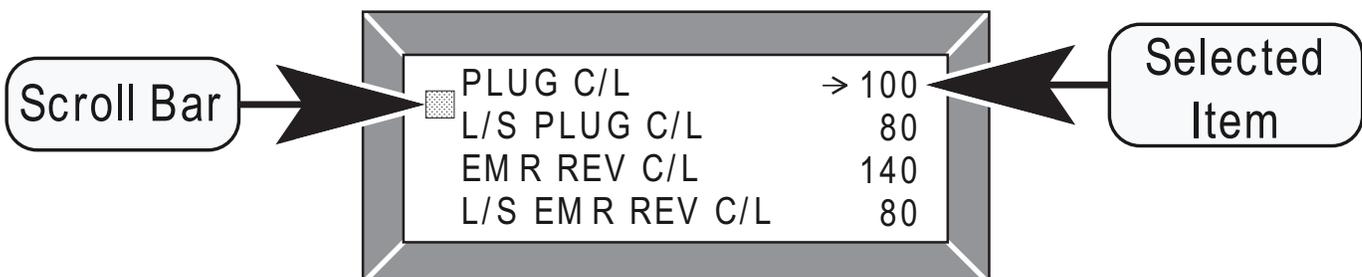


**SCROLL
DISPLAY**



A small scroll bar at the left of the display window provides a rough indication of the position of the four displayed items within the entire menu. That is, when the bar is at the top of the window, the top of the menu is displayed. As you scroll through the menu, the bar moves downward. When the bar is at the very bottom of the window, you have reached the end of the menu. This sample display is from the Program Menu (**Figure 2**).

FIGURE 2



PROGRAMMER OPERATION

The two CHANGE VALUE arrow keys are used to increase or decrease the value of a selected menu item. Like the SCROLL DISPLAY arrow keys, the CHANGE VALUE arrow keys can be pressed repeatedly or be held down. The longer a key is held, the faster the parameter changes. This allows rapid changing of any parameter.

An LED on each CHANGE VALUE arrow key indicates whether the key is active and whether change is permissible. When the value of a parameter is being increased, the LED on the “up” CHANGE VALUE key is on until you reach the maximum value for that parameter. When the LED goes off, you cannot increase the value.

The MORE INFO key has three functions: (1) to display more information about the selected item, (2) to access the Special Program and Special Diagnostics modes (when used together with the PROGRAM and DIAGNOSTICS keys), and (3) to initiate certain commands (such as the Self Test).

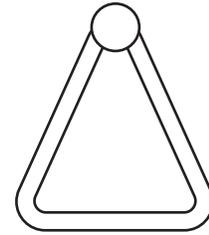
“More information” is available in all of the programmer operating modes. After using the MORE INFO key to display additional information about the selected item, press the MORE INFO key again to return to the original list.

OPERATING MODES

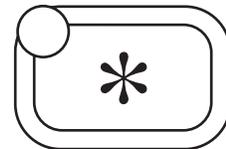
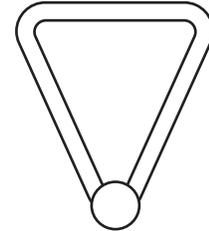
PROGRAM MODE

In the **Program** mode, accessed by pressing the PROGRAM key, all the adjustable parameters and features of the controller are displayed (four at a time), along with their present settings. The setting of the selected item, the item at the top of the display, with the flashing arrow can be changed, using the two CHANGE VALUE keys.

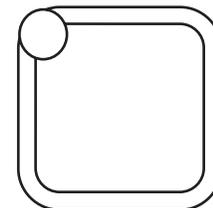
The LEDs on these keys indicate whether there is still room for change. That is, when the upper limit of a parameter’s range is reached, the LED on the “up” key no longer lights up indicating that the present value cannot be increased; when the lower limit is reached, the LED on the “down” key no longer lights up.



**CHANGE
VALUE**



MORE INFO



PROGRAM

OPERATING MODES

PROGRAM MODE (CONTINUED)

The MORE INFO key, when used in the Program mode, displays a bar graph along with the minimum and maximum values possible for the selected parameter. Parameters can be changed either from the main Program Menu or after the MORE INFO key has been pressed and the additional information is being displayed.

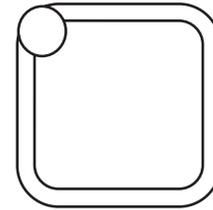
TYPICAL PROGRAM MENU

ACCEL MAX SPD	Acceleration rate at maximum throttle requests, in seconds
ACCEL MIN SPD	Acceleration rate at minimum throttle requests, in seconds
REV ACCEL MAX	Reverse accel rate at maximum throttle requests, in seconds
REV ACCEL MIN	Reverse accel rate at minimum throttle requests, in seconds
REV DECEL MIN	Reverse decel rate at minimum throttle requests, in seconds
M1 MAX SPD	Mode 1 max. speed with speed pot at max, as % available
M2 MAX SPD	Mode 2 max. speed with speed pot at max, as % available
M1 MIN SPD	Mode 1 max. speed with speed pot at min, as % available
M2 MIN SPD	Mode 2 max. speed with speed pot at min, as % available
M1 REV MAX SPD	Mode 1 max. reverse speed with speed pot at max, as % available
M2 REV MAX SPD	Mode 2 max. reverse speed with speed pot at max, as % available
THRTL AUTOCAL	Wigwag throttle centering utility: On/Off

TEST MODE

In the **Test** mode, accessed by pressing the TEST key, real-time information is displayed about the status of the inputs, outputs, and controller temperature. For example, when the status of the forward switch is displayed, it should read "On/Off/On/Off/On/Off" as the switch is repeatedly turned on and off. In the Test mode, the item of interest does not need to be the top item on the list; it only needs to be among the four items visible in the window. The Test mode is useful for checking out the operation of the controller during initial installation, and also for troubleshooting should problems occur.

The MORE INFO key, when used in the Test mode, causes additional information to be displayed about the selected item (top line in the window).



TEST

TYPICAL TEST MENU

HEAT SINK TEMP	Heatsink temperature, in °C
THROTTLE %	Throttle request: 0–100% of range
SPD LIMIT POT	Speed limit pot rotation: 0–100%
BATT VOLTAGE	Battery voltage across the capacitors
MODE INPUT A	On = Mode 1; Off = Mode 2
REVERSE INPUT	On = reverse is selected
INHIBIT IN	On = operation is inhibited
EM BRAKE DRVR	On = electromagnetic brake is mechanically released
MAIN CONT	On = voltage is applied to main relay coil
MOTOR R	Cold motor resistance, in mOhms
PUSH ENABLE IN	On = push enable switch is closed

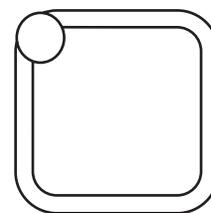
OPERATING MODES

DIAGNOSTICS MODE

In the **Diagnostics** mode, accessed by pressing the DIAGNOSTICS key, currently active faults detected by the controller are displayed.

The MORE INFO key, when used in the Diagnostics mode, causes additional information to be displayed about the selected item.

The following is not a menu as such, but a list of possible messages you may see displayed when the programmer is operating in either of the Diagnostics modes. The messages are listed here in alphabetical order for easy reference.



DIAGNOSTICS

TYPICAL DIAGNOSTICS AND DIAGNOSTIC HISTORY

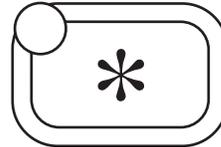
BRAKE ON FAULT	Electromagnetic brake coil open or driver short
BRAKE OFF FAULT	Electromagnetic brake coil short or driver open
CURRENT SENSE FAULT	A/D current sense voltage out of range
EEPROM FAULT	Error in reading EEPROM locations
HPD	High pedal disable (HPD) fault
HW FAILSAFE	Motor voltage fault
LOW BATTERY VOLTAGE	Battery voltage too low (<17 volts)
MAIN CONT FLTS	Main contactor did not close or did not open
MAIN ON FAULT	Main contactor driver failed short
MAIN OFF FAULT	Main contactor driver failed open
NO KNOWN FAULTS	No known faults
OVERVOLTAGE	Battery voltage too high (>36 volts)
POWER SECTION FAULT	MOSFET driver fault, or shorted motor wiring
PRECHARGE FAULT	Capacitor bank voltage < minimum operating voltage
PROC/WIRING FAULT	HPD fault present >10 seconds
SPD LIMIT POT FAULT	Speed limit pot input voltage out of range
THERMAL CUTBACK	Cutback, due to over-/under-temperature
THROTTLE FAULT 1	Throttle input voltage out of range

OPERATING MODES

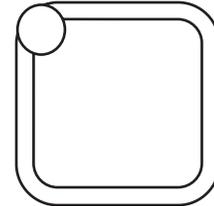
SPECIAL PROGRAM MODE

The **Special Program** mode allows you to perform a variety of tasks, most of which are self-explanatory. Through the Special Program Menu, you can revert to earlier settings, save controller settings into the programmer memory, load the controller settings from the programmer into a controller, clear the controller's diagnostic history, adjust the contrast of the programmer's LCD display, select the language to be displayed by the programmer, and display basic information (model number, etc.) about the controller and the programmer.

To access the Special Program mode, first press the MORE INFO key. Then, while continuing to hold the MORE INFO key, press the PROGRAM key. The LED on the PROGRAM key will light, just as when the programmer is in Program mode. To distinguish between the program and Special Program modes, look at the menu items in the display.



MORE INFO



PROGRAM

The MORE INFO key is used initially to access the Special Program mode, and once you are within the Special Program mode, it is used to perform the desired tasks. To adjust the contrast in the display window, for example, select "Contrast Adjustment" by scrolling until this item is at the top of the screen, and then press MORE INFO to find out how to make the adjustment.

SPECIAL PROGRAM MENU

RESET ALL SETTINGS	Revert to original settings
CONT SETTINGS - PROG	Save controller settings in programmer
PROG SETTINGS - CONT	Load programmer settings in controller
CLEAR DIAG HISTORY	Clear diagnostic history memory
CONTRAST ADJUSTMENT	Adjust display contrast
LANGUAGE SELECTION	Select displayed language
PROGRAMMER INFO	Display programmer information
CONTROLLER INFO	Display controller information

OPERATING MODES

SPECIAL DIAGNOSTICS MODE

In the **Special Diagnostics** mode, the controller's diagnostic history file is displayed. This file includes a list of all faults observed and recorded by the controller since the history was last cleared. (**Note:** The maximum and minimum temperatures recorded by the controller are included in the Test Menu). Each fault is listed in the diagnostic history file only once, regardless of the number of times it occurred.

To access Special Diagnostics, first press the MORE INFO key. Then, while continuing to hold the MORE INFO key, press the DIAGNOSTICS key. The LED on the DIAGNOSTICS key will light, just as when the programmer is in Diagnostics mode. The seat switch must be open in order to access the diagnostic history file. The MORE INFO key, when used within the Special Diagnostics mode, causes additional information to be displayed about the selected item.

To clear the diagnostic history file, put the programmer into the Special Program mode, select "Clear Diagnostic History", and press the MORE INFO key for instructions. Clearing the diagnostic history file also resets the maximum/minimum temperatures in the Test Menu.

TYPICAL DIAGNOSTICS AND DIAGNOSTIC HISTORY

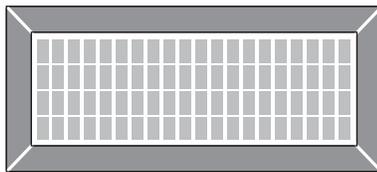
BRAKE ON FAULT	Electromagnetic brake coil open or driver short
BRAKE OFF FAULT	Electromagnetic brake coil short or driver open
CURRENT SENSE FAULT	A/D current sense voltage out of range
EEPROM FAULT	Error in reading EEPROM locations
HPD	High pedal disable (HPD) fault
HW FAILSAFE	Motor voltage fault
LOW BATTERY VOLTAGE	Battery voltage too low (<17 volts)
MAIN CONT FLTS	Main contactor did not close or did not open
MAIN ON FAULT	Main contactor driver failed short
MAIN OFF FAULT	Main contactor driver failed open
NO KNOWN FAULTS	No known faults
OVERVOLTAGE	Battery voltage too high (>36 volts)
POWER SECTION FAULT	MOSFET driver fault, or shorted motor wiring
PRECHARGE FAULT	Capacitor bank voltage < minimum operating voltage
PROC/WIRING FAULT	HPD fault present >10 seconds
SPD LIMIT POT FAULT	Speed limit pot input voltage out of range
THERMAL CUTBACK	Cutback, due to over-/under-temperature
THROTTLE FAULT 1	Throttle input voltage out of range

PEACE-OF-MIND PROGRAMMING

Each time the programmer is connected to the controller, it acquires all the controller's parameters and stores them in its temporary memory. You can revert back to these original settings at any time during a programming session via the Special Program Menu. Select "Revert to Previous Settings" by scrolling it to the top of the display window, press the MORE INFO key, and follow the instructions displayed. Any inadvertent changing of parameters can be "undone" using this procedure, even if you can't remember what the previous settings were, **as long as the programmer has not been unplugged and power has not been removed from the controller.**

PROGRAMMER SELF TEST

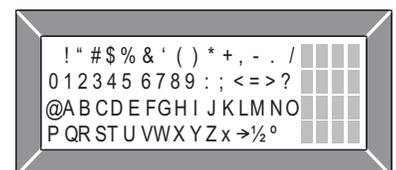
You can test the programmer by displaying two special test screens. Press the MORE INFO key while the programmer is powering up. During the Self-Test, you can toggle between the two test screens



by pressing the SCROLL DISPLAY keys (**Figure 3**). The first screen turns on every LCD element and the second screen displays all the characters used in the various menus. As part of the Self-Test, you can also test the keys by pressing each one and observing whether its corner LED lights up. To exit the Self-Test, unplug the programmer or turn off the controller, and then repower it without holding the MORE INFO key.



FIGURE 3



CURTIS 1311 PROGRAMMER

1 - INTRODUCTION

The Curtis Model 1311 Handheld Programmer simplifies programming, testing and diagnosing Curtis Speed Controllers and Auxiliary Devices. It provides a simple and intuitive interface to Curtis products for testing, diagnostics and parameter adjustments.

1.1 FEATURES

- Compatible with Curtis speed controllers and auxiliary devices.
- Backward compatible to the Curtis Model 1307 Programmer.
- Intuitive and simple Menu navigation.
- Inc/dec Key for real-time adjustment of parameters.
- Read and clear diagnostic history, monitor real-time data and perform tests.
- Menu and SubMenu structure provide a clear organization of parameters.
- Bookmark Keys provide fast swapping between three user selected Menus.
- Detail screens show units, min/max ranges and bar graph.
- Allows cloning of data between controllers.
- Graphic LCD can display up to seven lines of information.
- Restricted data is controlled by four access levels; OEM, Dealer, Service and User.
- Cable options to interface with all Curtis controllers; Molex, Conxall and RJ11.

1 - INTRODUCTION

1.2 MODEL VARIANTS

Model 1311 Handheld Programmer is offered in four access level models:

- 1311-1101 User programmer (most restrictive programmer; limited view into the system and a limited number of parameters and operations)
- 1311-2201 Service programmer
- 1311-3301 Dealer programmer
- 1311-4401 OEM programmer (the broadest access to parameters and system values).

In order to connect the 1311 Programmer to a Curtis product, one of three cables must be attached:

- Conxall for the 1288 and MC-2 product line
- RJ11 for the 1207 motor controller
- Molex for all other Curtis products

Each cable must be ordered separately.

1.3 SPECIFICATIONS

Operating Ambient Temperature -10°C to 50°C

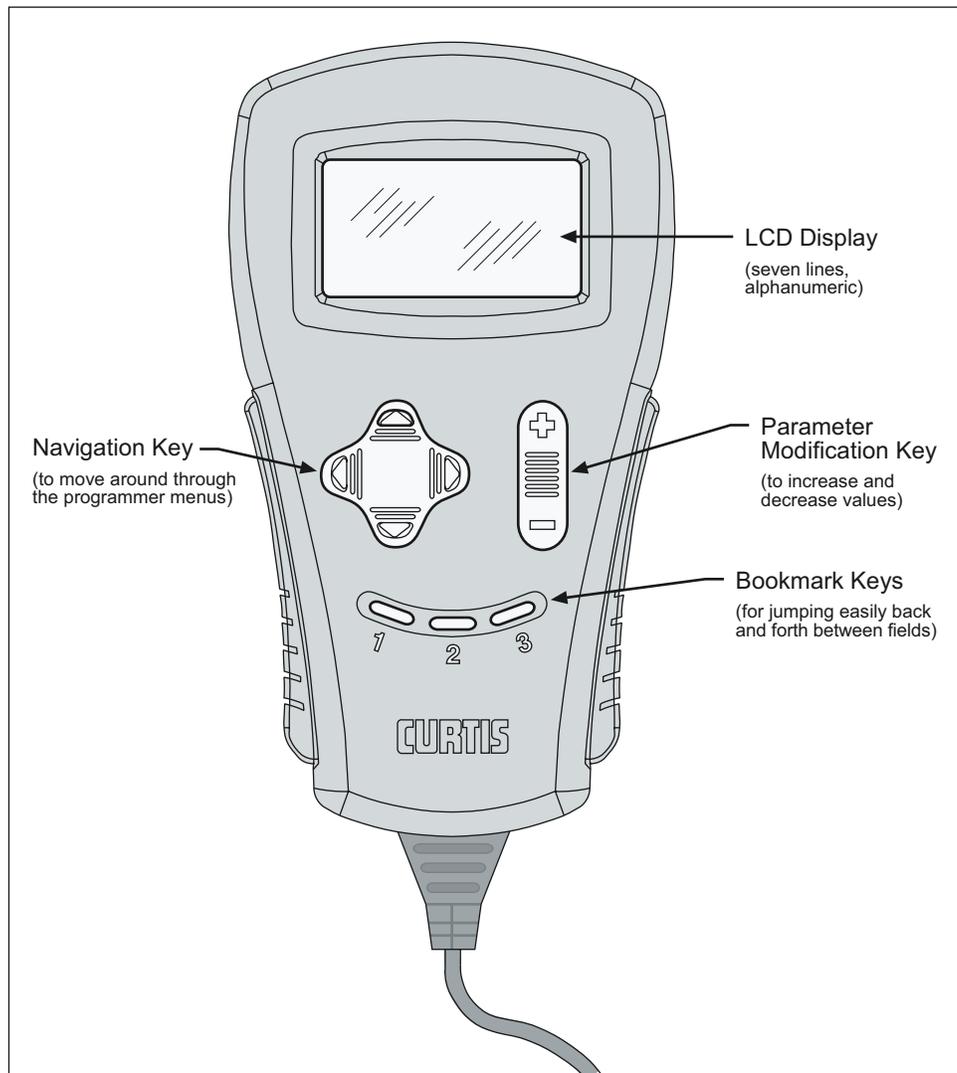
Storage Temperature - 40°C to 70°C

Environmental Protection IP20

Weight 0.4 Kg

Plug the 1311 into a Curtis programmer port only. Voltages and other interface circuits can result in permanent damage to the programmer !

2 - OVERVIEW



2.1 DISPLAY SCREEN

A 128 x 64 pixel graphic LCD screen capable of displaying up to seven lines of text and graphic images simultaneously.

2.2 MENU NAVIGATION KEY

Moves the screen cursor up or down through the Menu list (top or bottom arrow), and opens or closes Sub Menus (right and left arrows).

2.3 DATA INC/DEC KEY

Changes the value of the parameter indicated by the cursor.

2.4 BOOKMARK KEYS

The three Bookmark Keys allow you to quickly go back to your favorite selections without having to navigate back through the Menu.

To set a position in the Menu, hold a Bookmark Key down for four seconds, until the Bookmark set screen will be displayed.

To jump to a selected Bookmark position, press the appropriate Bookmark Key.

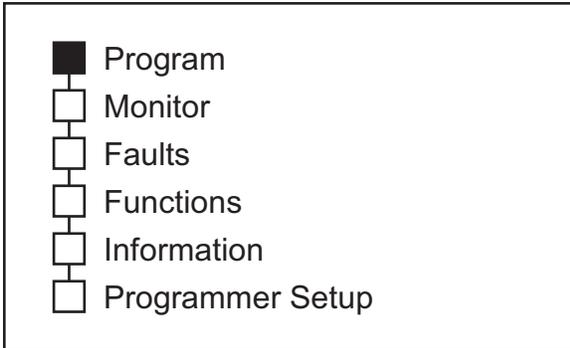
The Bookmarks are not permanently stored in the 1311. They are cleared when the programmer is unplugged.

3 - OPERATION

3.1 MENU STRUCTURE

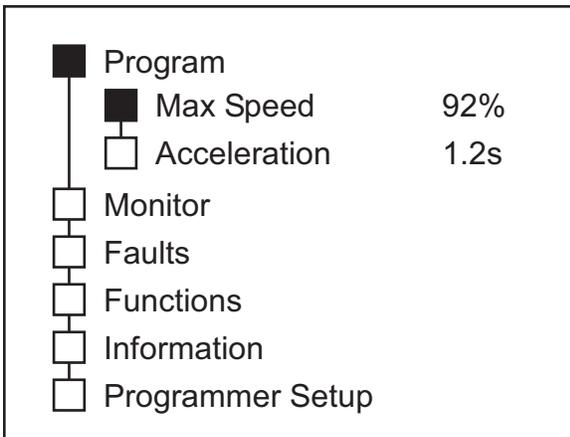
After the data is uploaded from the unit (controller, charger, etc), the Main Menu appears. This is the standard Menu for all Curtis products and the starting point for all basic programmer functions. If there are no entries within a Menu, then that Menu title (Program, Monitor etc) will not be displayed.

The Main Menu looks like this:

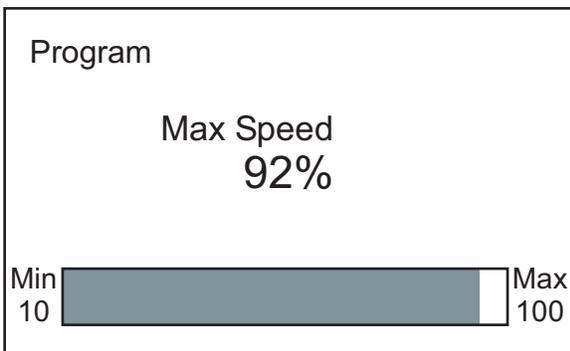


A blinking square on the left edge indicates the position of the cursor. You are at the top-level Menu so only one column of boxes (cursor positions) exist. As you go deeper into the Menu structure (using the four-directional Menu Navigation Key) additional columns will be shown.

Entering a Main Menu (right arrow on the Menu Navigation Key) brings up a Sub-Menu, displayed in a second column and indented right.



From the Program Menu you can go one additional Sub Menu deeper into the detail screen. Press the right arrow Menu Navigation Key again and a screen with additional information and bar graph will appear.



You can back out of this screen and the Sub-Menus (there can be more than one Sub level) by pressing the left arrow on the Menu Navigation Key.

3 - OPERATION

3.2 MAIN MENU

The Main Menu is the starting point for all Curtis programmable products. All basic functions are readily accessed from this point.

Program

The Program Menu may contain several Sub-Menus of parameters. The unit (controller, charger, display, etc) is setup with specific operating conditions using the 1311 handheld programmer in this Menu. Items like max speed, current limits, timeouts, and modes are common parameters set in the Program Menu.

Monitor

The Monitor contains a list of all the variables that can be read and displayed. Common items are battery voltage, throttle position, input status and temperature. If the list is too long, Sub- Menus may be used to categorize them.

Faults

The Faults Menu provides the present status and access to past fault history.

Functions

The 1311 handheld programmer can also be used to copy data between units, reset data and many other functions unique to the unit. The Functions Menu provides access to these.

Information

When the unit is connected to the 1311 handheld programmer, information, such as software, hardware and parameter block versions are also uploaded. The Information Menu provides a quick overview.

Programmer Setup

There are several setup options and information that can be accessed in this Menu.

3.3 INTERFACE PROTOCOLS AND BACKWARD COMPATIBILITY

Model 1311 has several protocols to communicate with other Curtis products. It automatically detects the correct protocol and begins the data upload immediately upon power up. (It is critical that the correct cable is used).

Model 1311 Handheld Programmer also emulates the communication of the 1307 handheld programmer. 1311 is backward compatible with products like 1207, 1223 and other products designed to communicate with model 1307. The 1307 protocol does not support Sub-Menus.

1307 backward compatibility is provided using the same Main Menu structure as all other 1311 protocols. The 1307 had special Keys labeled PROGRAM, TEST and DIAGNOSTICS, which are accessed under the Program, Monitor and Faults 1311 Menus. The 1307 MORE INFO is similar to the 1311 detail screen and Functions Menu. Changing the data and scrolling through the list is similar between the 1311 and the 1307.

3.4 CHANGING A PARAMETER

Many Curtis products allow customization to meet designer or user preferences. The parameters that are made available to the OEM, dealer, service technician or end-user, are controlled by the 1311 access level (see section 1.3 Model variants). Not every parameter is visible to every user. When the 1311 is connected to a Curtis product, a parameter list (block) is uploaded to the programmer along with the present settings. You can easily scroll through this list and change the settings and quickly test the results. To access a parameter, use the Menu Navigation Key to select

'Program'

Sub-Menus organize the parameter list. Scroll through the list and press the right arrow on the Menu Navigation Key to enter the Sub-Menu.

When a parameter is displayed, its value and units (abbreviated) will be displayed on the right of the screen. You can change the value of the parameter by using the Data Inc/Dec Key. Alternately, you can press the right arrow Menu Navigation Key once more and enter the detail screen (see section 3.1 Menu Structure for more details). A bar graph appears as well as min and max data points. Change the parameter value by pressing the Data Inc/Dec Key (the bar graph shows the relative value of the parameter).

1311 automatically sends the change to the unit. The new value is set as soon as the Data Inc/Dec Key is released.

Test the system at any time, even with the unit active.

To close a Menu, Sub-Menu or detail screen, press the left arrow on the Navigation Key.

3 - OPERATION

3.5 REAL-TIME MONITORING

To aid installation, service and troubleshooting, the 1311 Handheld Programmer can request and display a variety of real-time data from the Curtis unit. Each Curtis product has its own list of items that can be displayed. This list is found under the Main Menu heading

'Monitor'

Use the right arrow on the Menu Navigation Key to select the list of monitor variables. If the list is more than one screen long, use the Up and Down Buttons arrows on the Menu Navigation Key to scroll through the list.

In the "list" mode, every value is periodically updated.

To view a single monitor variable at a faster rate, select a single variable from the list (using the right arrow) and a detail screen will display. This screen will show only that variable and the update rate will be faster.

To leave the Monitor Menu or detail screen, press the left arrow on the Navigation Key.

3.6 READING FAULTS AND THE DIAGNOSTIC HISTORY FILE

Model 1311 allows access to the preset and past status of the system or unit you are connected to. Each Curtis product runs continuous self-diagnostics and will record and log an error event in non-volatile memory. When the 1311 is connected to the unit, this log file is automatically uploaded into the handheld programmer.

To see the present status of the unit, use the Menu Navigation Key to select

'Faults -> System Faults'

To access this log, use the Menu navigation Key to select

'Faults -> Fault History'

The faults are shown as a code and descriptive text. If there are multiple faults, you may have to scroll through the list using the Up and Down Buttons on the Menu Navigation Key.

It is useful to clear the fault history after reading it. To do this, select

'Faults -> Clear Fault History'

You will be asked to confirm your actions. Use the Increment arrow (+) for yes and decrement arrow (-) to cancel and not clear the Fault History.

The MC-2 systems have an additional Sub-Menu to select the module. For example **'Faults -> Controller -> Fault History'**.

3 - OPERATION

3.7 CLONING AND RESTORING THE PREVIOUS PROGRAMMING

Cloning is the process of duplicating parameter settings from one unit to others, making copies or “clones”. You may only clone units with the same hardware, software and parameter block. You cannot clone the MC-2 or products using the MCP protocol.

The special cloning functions are listed on the programmer in the Menu

‘Functions -> Settings’.

From here, you can select

‘Get Settings From Controller’

This will upload the data from a unit into the 1311. Or,

‘Write Settings To Controller’

This will download the present data stored in the 1311 to the unit. This process will only work between identical models. Model 1311 will not allow cloning between different models (1228 to 1243) nor between similar models (1244-4401 to 1244-4402). Only the data accessible by the 1311 is cloned. For example, a User level 1311 will only clone User level data and will not clone the OEM, Dealer or Service level data.

You may also easily restore the original settings of the unit . Each time the programmer is connected to a unit, it uploads the present data and stores it in a “temporary archive” memory. You can revert back to the original settings any time during a programming session by selecting the Menu

‘Functions -> Settings -> Reset All Settings’.

Any inadvertent change of parameters can be ‘undone’ using this procedure - even if you can’t remember what the previous settings were - as long as the programmer has not been unplugged and power has not been removed from the controller.

3.8 INFORMATION DISPLAYS

Besides the parameters, values and fault history, each Curtis product contains a small file describing the basic revision level of the product. The Information Menu provides access to that data.

To view the product information, use the Menu Navigation Key to select ‘Information’ in the Main Menu (remember to press the right arrow to select a Menu). A screen will show the available information. Press the left arrow to exit.

3.9 PROGRAMMER SETUP

Model 1311 Handheld Programmer itself has a few items that can be viewed, setup and customized to the user’s preference.

Some useful functions are

‘Programmer Setup -> Program -> LCD-Contrast’

Which allows the user to set the desired contrast level for best viewing.

‘Programmer Setup -> Information’

Which shows the current revision level of the 1311 handheld Programmer.

