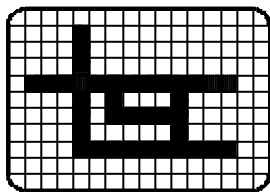

WASHTECH LC102

USER MANUAL

(Sixth Edition)



TOTAL SYSTEMS CONTROL LTD

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Prepared by : Total Systems Control Ltd.

First Edition 6 December 1991(version 1.0)

Second Edition 8 May 1993 (version 4.12)

Third Edition 3 December 1993 (version 4.50)

Fourth Edition 25 April 1995 (version 4.68)

Fifth Edition 20 June 1997 (version 5.06)

Sixth Edition 27th May 1998 (version 5.06)

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About This Manual

This manual is one of three which describe the Washlink / LC102 system:

- Service Manual. Explains all technical, internal timers, detailed Setup explanations and fault finding and complete installation guide for an LC102.
- Washlink User Manual. Tells you how to use the Washlink system to supervise a network of LC102 controllers.
- LC102 User Manual. Tells you how to program and operate the LC102 controller from its own keypad.

Getting Started

Switching on and power up conditions. How to use the keypad and display.

Changing Mode

How to use the keypad and the access codes to change to the correct mode if the machine is not in the Mode that you want.

Auto Mode

How to use Auto Mode for everyday washroom activity: loading and executing formulae and displaying information about the current state of the machine.

Move Mode

How to use Move Mode to go directly to another step in a formula that you are currently running in Auto Mode.

Manual Mode

How to use Manual Mode to control all the washer / extractor functions with the keyboard.

Programming

How to use Programming Mode to create and edit formulae you wish to run on your machine.

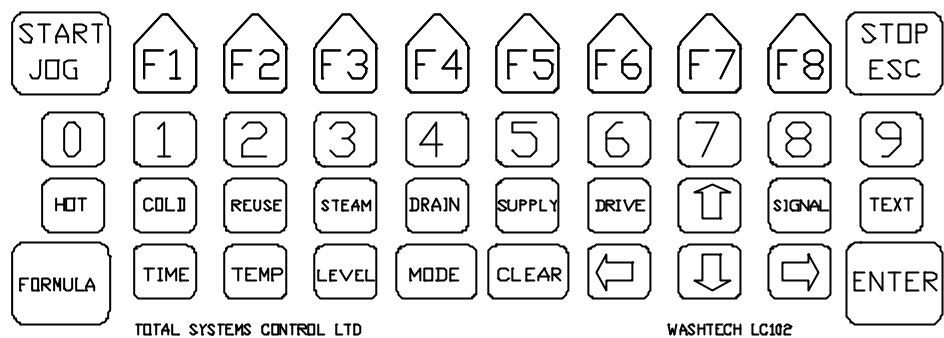
Configuring The System

How to use Setup 2 to change configuration settings of levels, temperatures, times, supplies and other general settings.

Diagrams

In this manual diagrams are used to represent the 40 column by 4 row LCD screen and the function keys that correspond to the function abbreviations on the bottom row of the display.

AUTO	>	2	AVERAGE SOIL	<
SELECT FORMULA		9	CURTAINS	
SCROLL & ENTER		3	FOUL LINEN	
PGUP PGDN		1	UNIFORMS	



Here pressing the F2 key on the keypad would Page Down to display the next four formulae down the list.

System Overview

The LC102 is a microprocessor based control system for industrial washer / extractors and dyer extractors. It can be retro-fitted to a wide range of existing machines and provides automatic control of all wash functions by means of programmable formulae or manual control from the keyboard/display console.

The LC102 can be installed as a stand-alone unit or in a network managed by Washlink, on a central computer. { In the absence of a network system, data can be transferred to a laptop or portable PC for management reporting purposes. }

Wash formulae are programmed at the keyboard display console itself or on the computer. Once entered, they are held in non volatile memory and can be recalled at the touch of a key for executing or editing.

Memory back up is possible with the Cyber card memory backup system exclusive to the LC102.

The LC102 provides fully automatic control but also has built in versatility. For example, a formula can be manually halted and re-started at any stage, or a stop can be programmed to signal the operator and prompt them to introduce a chemical additive.

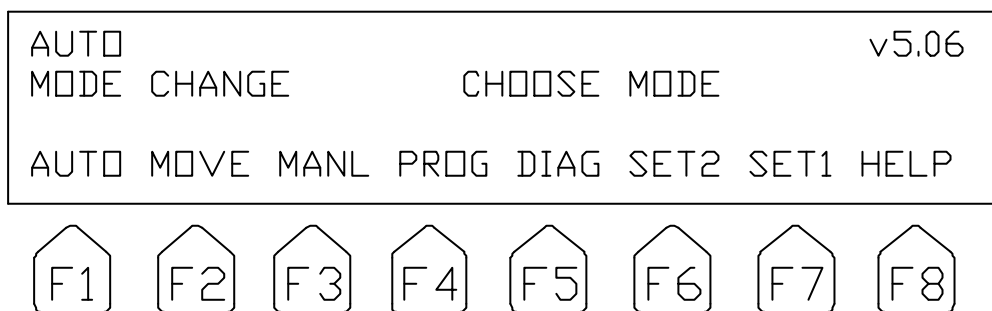
The LC102 is designed to promote a high degree of washroom efficiency. Target standards for times, levels, temperatures etc. are entered and retained for comparison with machine performance at any time.

All information required by the operator is displayed on screen and further data is easily accessible. The network system provides detailed monitoring and reporting of the whole plant performance.

Software Version Information

To display the version number of the software that is installed in the Washtech LC102 press the Mode key. The software version will be displayed in the top right hand corner of the screen. If the machine is in Auto mode you must stop the machine first.

Software Version Number

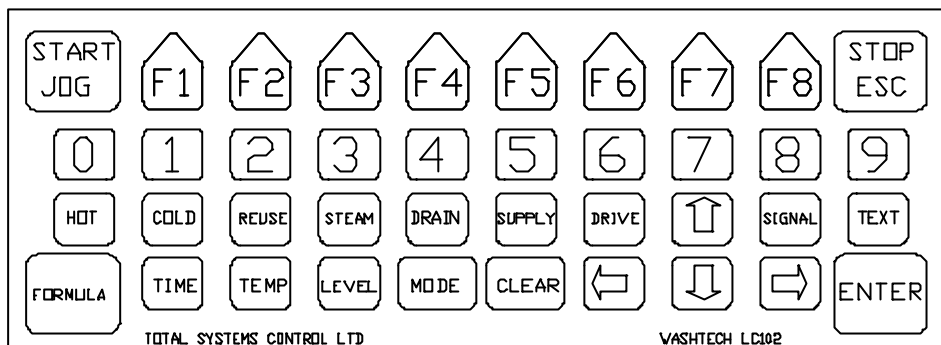


Getting Started

When switched on, the controller always powers up in Auto Mode at the formula and step last used when powered down. This is shown on the LCD display.

Getting Started / Display on Power Up

AUTO	F01	LEVEL	TIME	DRIV	STEP	TIM	MEASR
STOPPED		0cm	17C	STOP	00:00:00		00:00
S-01 1ST FLUSH							



Dedicated Keys

Many functions are carried out with single key presses on the dedicated keys of the keypad. For example press MODE, CLEAR, START and STOP. Some LC102 operations require stepping through one or more screens of information. To abort or return to a previous screen press ESC.

Function Keys (Soft Keys)

The keys F1-F8 on the keypad perform different functions depending on the mode and particular screen displayed.

The action of the function key is indicated by the four character abbreviation directly above on the lower line of the display. Further information about an operation are available by pressing HELP (F8).

The Pointer

When you are required to make a selection from a list, pointers " >.....< " appear at either end of the current line.

The pointer is moved up and down using the up arrow (↑) and down arrow (↓) keys respectively.

If there are more than four lines in a list, the screen can be scrolled using PgUp and PgDn which appear above function keys F1 and F2 respectively.

The Cursor

Where numeric or alphabetical data needs to be input, the cursor indicates the current character position and is moved by the left (←), right (→), up (↑) and down (↓) arrow keys.

Entering Text

Entering text is carried out using an alphabet sector which appears on screen.

Type the text, letter by letter, as follows:

1. Use the left or right arrow key to move the cursor to the position where the character is to be placed.
2. Press TEXT to access the alphabet sector.
3. Move the cursor to the character required using the arrow keys and press ENTER to insert this character. (For a space, use the last character in the alphabet next to the decimal point.)
4. Use the numeric keys at any time to insert numbers.

Repeat steps 1 to 4 to fill in text. Characters to the right of the cursor are automatically scrolled to the right as new letters are inserted.

Finally press ESC to exit the alphabet sector and press ENTER to accept the text string that has been created.

Example of Entering Text Display

PROG STEP 5	MAIN WASH	ABCDEFGH
FORM 1	[] IJKLMNOP
Signal		QRSTUVWXYZ
ENTER when finished		YZ/- .



Enter numbers at the cursor position using the numeric keys on the keypad.

Deleting Characters

Position the cursor over the character to be deleted and press CLEAR.

Changing Mode

The LC102 controller has seven modes of operation:

1. Auto
2. Move
3. Manual
4. Program
5. Diagnostic
6. Setup 2 (user configuration)

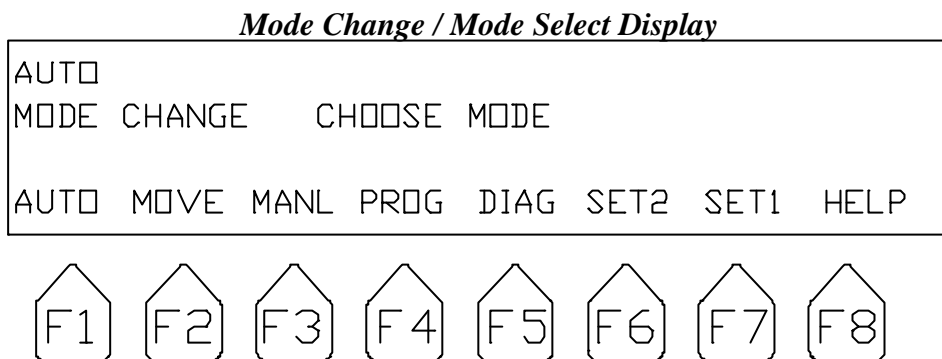
7. Setup 1 (installation configuration)

For safety and security of the system, all operators use a personal access code which permits them to use only certain modes.

Setup 1 and Setup 2 mode are used during installation or modification of the system. Setup 1 requires a master security code number (see Washlink Installation Manual for further information on these modes).

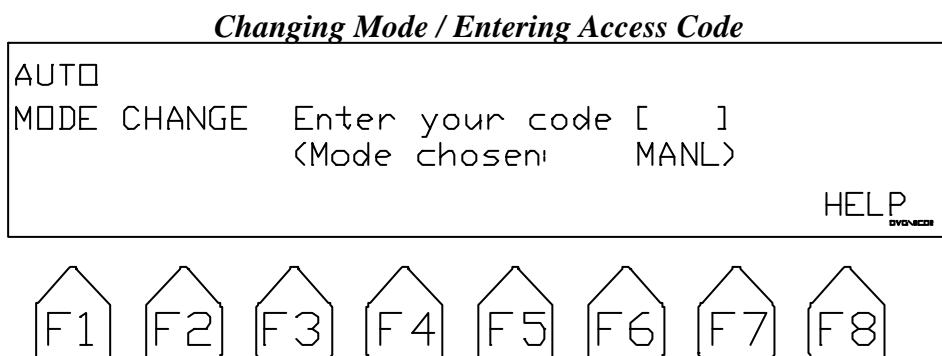
Change Mode

To change mode, make sure the machine is stopped and press MODE. The following display appears:



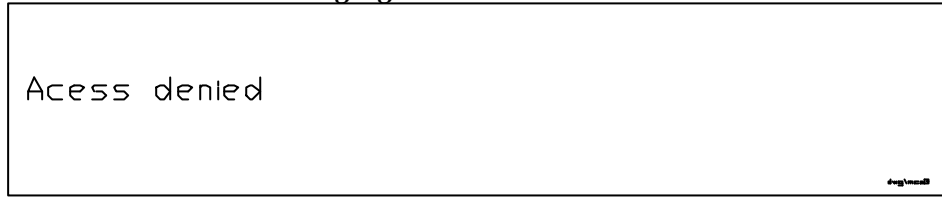
Select the required mode by pressing the corresponding function key (F1-F7) and when prompted, type your access code using the numeric keys and press ENTER.

You do not require an access code to change to Auto mode as this is the primary mode for the operation of the machine.



When prompted, type your access code using the numeric keys and press ENTER.

Changing Mode / Access Denied



If your code does not permit use of the new mode, the message `Access Denied' is displayed. The controller then reverts to the last used mode.

When the mode key is pressed the current software version number as well as program steps used and remaining are displayed on LCD display.

Auto Mode

This is the most frequently used mode; it is for everyday washroom activity: loading and executing formulae and displaying information about the current state of the machine.

To select Auto Mode, go to the mode change screen and press F1 (see Changing Mode). You do not need a personal access code to enter AUTO.

Auto Mode operation normally proceeds as follows:

- Select a formula

- Position and load the washwheel
- Start and run the formula
- Display detailed status information
- Stop formula at a particular step if required

While the formula is running, the display shows the general status of the washwheel. The formula can be interrupted at any time by pressing Stop once.

Note: Pressing Stop twice will take you right out of the current formula.

Select Formula

In Auto Mode and with the machine stopped, press ESC to access the list of formulae available.

The screen shows a numbered list of formulae in alphabetical order. The pointer appears next to the most recently used formula.

To run this formula again press ENTER. To select a different formula, move the pointer to the required formula with the cursor keys and press ENTER.

Auto Mode / Select Formula

AUTO	1	SHEETS	
SELECT FORMULA	> 2	UNIFORMS	<
SCROLL & ENTER	3	MEDI PADS	
PGUP PGDN	4	AVERAGE SOIL	

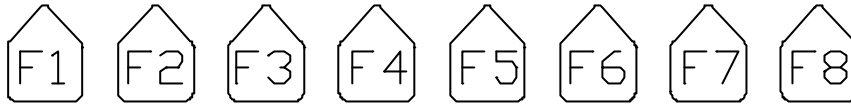


If you are require the load weight and your personal access code before a program is run, then the optional screens below will present themselves before any machine can run its next formula. These Optional screens can be configured in SETUP 2 General. (see Configuring the System / General).

Optional Screen

Auto Mode / Get Load Weights

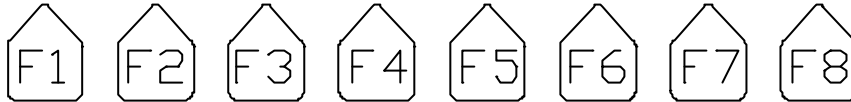
AUTO			FORM 01	SHEETS		
STOP	LOT .1.	LOT .2.	LOT .3.	LOT .4.		
ENT	No [1]	No 1	No 1	No 1		
LOTS	KG 45	KG ---	KG ---	KG ---		



Optional Screen

Auto Mode / Enter OP Code

AUTO		FORM 01	SHEETS	
STOPPED		TOTAL LOAD	180.0 KG	
OP CODE		OPERATOR CODE	[]	
& ENTER				



Load the washwheel and press FORMULA when finished (the loading time is recorded). When ready, press START to start the formula.

Auto Mode / Machine Status

AUTO F03	LEVEL	TEMP	DRIV	STEP	TIM	MEASR
RUNNING	10cm	15C	WASH	00:03:00		00.00
Cold		S-01	1ST	FLUSH		



The display changes to show the machine status.

In the above example the water level is 10 cm, temperature is 15oC, cold water is on and drive is in wash. The step time remaining after reaching temperature, level and adding chemicals is 3 minutes.

Pressing the following keys to display their respective states:

TIME

TEMP
LEVEL
FORMULA
DRIVE
SIGNAL

Hold down the key if you wish the display to stay on screen for longer than the configured duration for temporary displays (see Configuring the System). Press another key for immediate change of display.

Time

Press the TIME key once for the first screen of information on the display.

Auto Mode / Time Display 1

AUTO		STEP	PROG	TIME	ELAPSED	=0:04:19
RUNNING		THIS	FORMULA	WAS	STARTED	-12:25am
FORM	03		EXPECT	THE	LOAD	FINISHED -01:25am
STEP	01		IT	IS	NOW	-SUN 27DEC 1992 - 07:16am



Press the TIME key again for a second screen of information on the display.

Auto Mode / Time Display 2

AUTO		FORMULA	RUN	TIME	ELAPSED	=0:28:04
RUNNING		AVERAGE	TIM	THIS	FORMULA	=1:25:03
FORM	03		STANDARD	TARGET	FORM.TIM	=1:20:00
STEP	01		FORMULA	PROG.TIM	REMAINS	=0:55:06

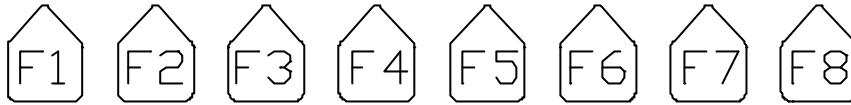


Press the TIME key for the third time to find out the reasons that the step time is not running.

Auto Mode / Step Time Not Running

The STEP TIME is not running because:
 Programmed fill level not reached
 Programmed temperature not reached
 Supplies are still to be added

DVS-AUT02



Temperature

Press TEMP to see the programmed target and actual temperatures. The time spent heating for the step is also displayed.

Auto Mode / Temperature Display

AUTO		PROGRAMMED TEMPERATURE	=	60 C
RUNNING		ACTUAL TEMPERATURE	=	15 C
FORM 03		LOWER LEVEL TEMP TRIP	<	58 C
STEP 01		HEATING TIME THIS STEP	=	00:01:14

DVS-AUT02



Press the TEMP key again for a display of the temperature gradient information

Auto Mode / Temperature Display 2

GRADIENT HISTORY	RIGHT	SIDE	MOST	RECENT
ERR*100	0	0	0	0
INT*100	0	0	0	0
OUTPUT%	0	0	0	0



The above display shows the last 8 readings taken from the temperature gradient being performed by the LC102. The readings will reflect how the temperature gradient settings in SETUP 2 (TEMP) are performing. For the gradient to be working efficiently the ERR*100 should be approaching 0.

If the machine is heating up or cooling down too fast the Temperature gradient sample time found in SETUP 2 (TEMP) is too large. This time turns on the steam valve or cold water valve for the initial part of the heat up or cooldown.

Level

Press LEVEL to see the programmed target and actual levels. The time spent achieving level for the step is also displayed.

Auto Mode / Level Display

AUTO		PROGRAMMED LEVEL	=	40CM
RUNNING		ACTUAL LEVEL	=	20CM
FORM 03		UNDER LEVEL TRIP	AT	38CM
STEP 01		TIM TO LEVEL THIS STEP	=	00:02:00



Press the LEVEL key again to see the volume of water in the machine.

Auto Mode / Level Display 2

AUTO		VOLUME OF WATER IN MACHINE IS
RUNNING		
FORM 01		567 Litres
STEP 01		

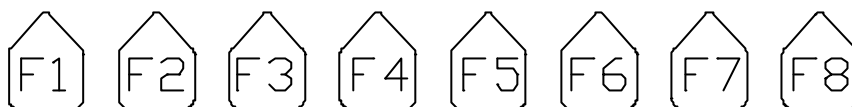


Formula

Press FORMULA to display the formula name.

Auto Mode / Formula Press Display 1

AUTO	F03	LEVEL	TEMP	DRIV	STEP	TIM	MEASR
RUNNING		10cm	55C	WASH	00:03:00		00.00
Cold		F-01 SHEETS					



Press FORMULA again to display further information.

Auto Mode / Formula Press Display 2

AUTO	THIS FORM RUN	NORMAL	TODAY	X_	----
RUNNING	THIS FORM RUN	INTRPT	TODAY	X_	----
FORM 04	TOTAL THIS FORM	NORMAL	RUN	X_	----
STEP 05	TOTAL THIS FORM	INTERUPTED		X_	----



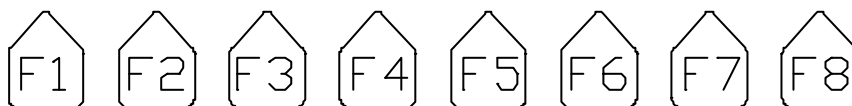
Drive

Press DRIVE key to display the current drive, speed in RPM and G force on the on the inner drum.

The speed and G force are obtained through the speed sensor installed on the washer extractor.

Auto Mode / Drive Display

AUTO	DRIVE ON NOW	=	WASH
RUNNING	SPEED RPM	=	----
FORM 01	G FORCE	=	----
STEP 02			



Press the DRIVE key again to display the Speed Pulse test screen.

Auto Mode / Drive Display 2

```
AUTO | SPEED INPUT PULSE WIDTH TEST
RUNNING | Pulse must be at least 1 wide
FORM 01 |          WIDTH = 1
STEP 01 |          SPEED RPM = 21
```



Signal

Press SIGNAL to display a preview of the what the next signal will be and in what step in of the formula it is.

Stop

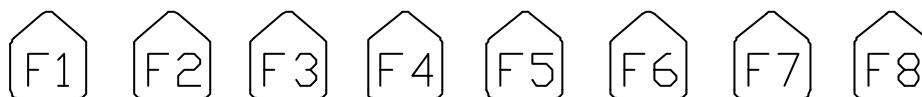
To stop the execution of a formula press STOP. All functions are interrupted and the wash is logged as being interrupted. The braking sequence activates to slow the machine to a safe stop. The screen shows the state, AUTO STOPPED, together with the current level, temperature, drive and step number. If STOP is pressed again then the formula is exited and logged as finished, you will automatically return back to the formula select screen to start again.

Automatic Chemical Supplies

If for some reason the machine was stopped in a step which has had chemical supplies added to it. The LC102 will ask the operator when they start the machine again, if they want the chemicals supplied again or to continue without supplies.

Auto Mode / Chemical Supplies reconfirm screen

```
The machine was stopped on this step.
Press FORMULA key to add supplies again,
or press START key to continue without
supplies.
```



Move Mode

MOVE allows you to go directly to a particular step while running in Auto Mode. The AUTO execution of the Formula must be halted by pressing STOP **once** only. You will not be allowed

to move if the machine is still running.

Move Mode / Mode Change Denied

Please stop machine before changing mode.



Press MODE to activate the MODE change screen and select MOVE (F2) and enter your operator code.

The list of steps in the current formula is displayed with the pointer at the current step. You can select the step you wish to move to by highlighting the step with the cursor keys.

To begin executing the formula at this step, press ENTER and then press START.

Manual Mode

In Manual Mode you use the Washtech LC102 console to operate all the washer/extractor functions. To select MANUAL mode go to the mode change screen and press MANL (F3). You will be required to enter your access code and press ENTER.

The washer is controlled using the following keys:

START
JOG and TILT (arrow keys)
HOT
COLD
STEAM
REUSE
SUPPLIES (function keys)
DRIVE
DRAIN
TIME
SUPPLY (Chemical Flushing)
STOP

When you press the key for an operation, the screen changes to display appropriate information.

Jogging and Tilting

Use jogging and tilting to position the wash wheel for loading, unloading or wash cycle as required. This can only be done when the drive is stopped.

Pulse jogging is only allowed when the door is open.

Continuous jogging is only allowed when the door is closed.

Hold down Start/jog key and one of the ARROW KEYS together until the washwheel is in the correct position:

Start + RIGHT	Tilt up to Load Position
Start + LEFT	Tilt Down to Unload
Start + UP	Jog Clockwise
Start + DOWN	Jog Counter Clockwise

While the machine is being tilted the bell will ring intermittently until the fully up or down position is reached.

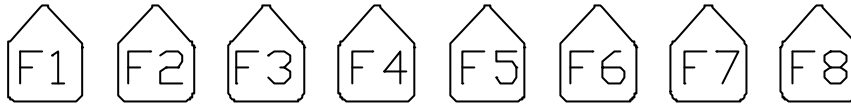
The machine must be in the down or wash position before starting a wash cycle otherwise a message appears: NOT IN WASH POSITION

When the machine attains either the wash position or the fully tilted position, it automatically stops tilting, the bell stops ringing intermittently and a message appears: WASH POSITION ATTAINED

Hot / Cold

To operate the hot and cold inlets press HOT or COLD on the keypad. The LC102 will show HOT and COLD on the screen.

MANUAL	TEMP	LEVEL	DRIVE	TIME	MEASURE	
	11 C	20cm	STOP	00:00	00:00	
HOT	COLD					
BRK	COND	DET	SOAP	SOUR	FLSH	<small>DVD-NAME</small>



Steam

Steam can only be injected by itself when the level is above the minimum configured for steam injection. The message STEAM will come up on the screen to show that the Steam valve is operating.

Manual Mode / Steam Inlet Operating

MANUAL	TEMP	LEVEL	DRIVE	TIME	MEASURE	
	11 C	20cm	STOP	00:00	00:00	
STEAM						
BRK	COND	DET	SOAP	H2O2	FLSH	<small>DVD-NAME</small>



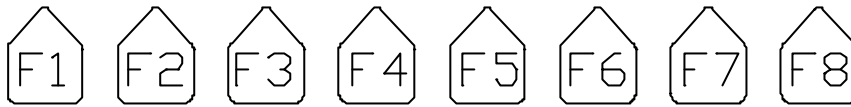
If you attempt to inject steam when the level is too low a message will appear on the screen 'LEVEL TO LOW' (see SETUP 2 / Levels to configure minimum steam level).

ReUse Water

When you press the REUSE key, four function keys (F1 - F4) become active to direct water from one of up to four reuse reservoirs into the washer extractor.

Manual Mode / Reuse Inlets

MANUAL	TEMP	LEVEL	DRIVE	TIME	MEASURE
	25C	20cm	STOP	00:00	00:00
RSE1	RSE2	RSE3	RCLD		



This water can be used in the same way that any other water is used during the wash process.

Chemical Supplies

To inject a particular chemical, hold down the appropriate key (F1-F8) for the duration required. While the output that controls the Supply is on, a "#" will appear next to the Supply chosen. (see Manual Mode / Supply Display - Break Injection).

The abbreviated names of chemicals along the bottom of the screen are chosen in Setup 2 (see Configuring the System).

While a supply is on, the duration is displayed under the MEASURE title.

Manual Mode / Supply Display - BREAK Injection

MANUAL	TEMP	LEVEL	DRIVE	TIME	MEASURE
	25 C	20cm	STOP	00:00	00:30
BRK #	COND	DET	SOAP	H2O2	FLSH



In the above example, the BRaK key (F1) has been held down for 30 seconds. if you try to inject a supply while the water level is below the minimum for injection, a message appears on the screen. `LEVEL TO LOW'.

(see SETUP 2 LEVEL to configure minimum level for chemicals).

Drive Speeds

To select a drive in Manual Mode, press DRIVE and then the key (F1-F7) as required, (see Manual Mode / Drive Selection Display). The Drive selections for typical Washer extractors are as follows:

F1 WASH

F2 GENTLE WASH
 F3 DRAIN
 F4 LOW EXTRACT
 F5 EXTRACT CYCLE
 F6 SPLIT EXTRACT CYCLE

F2 GENTLE WASH

This is a separate wash cycle in which a longer dwell time is allowed before rotation reversal. This has less mechanical action, for such things as woollens and delicates.

F6 SPLIT EXTRACT CYCLE

Split Extract is a special drive routine that is programmed into the LC102 to improve the extraction of mats and other items that hold pockets of water.

When this is implemented the machine will start to operate in a normal extract cycle. The machine will run in low extract for one minute and then slow to wash speed for two reversals with the drain open to allow pockets of water to be removed from the load in the machine. The machine then proceeds to carry out the rest of the extract cycle to high extract until the stop button is pressed.

Manual Mode / Drive Selection Display

MANUAL	TEMP	LEVEL	DRIVE	TIME	MEASURE
	25 C	20cm		00:00	00:30
WASH	GNTL	DRAN	LOW	EXT	SPLT
	WASH	BAL	EXT	CYCL	EXT



N.B The Drive selection shown may not apply to all machines. To find out what drive selection your machine has refer to the section titled Machine Notes.

Confirm your drive selection by pressing ENTER,

```

MANUAL TEMP  LEVEL DRIVE TIME  MEASURE
          25 C   20cm           00:00  00:30
          Drain Selected
-----Press ENTER to confirm-----

```



The machine then starts the drive that has been selected after the correct sequence has been carried out to ensure that the machine is safe to operate. Depending on what machine is configured the appropriate drives will be available for use. To stop the drive that is selected press STOP.

Drive selection for Dye Machines

If the machine that you are operating is a Dye machine then the list of options for the drives will be different because of the extra speeds that a dye machine has available for use. They are as follows:

F1	WAS1
F2	WAS2
F3	DRAIN
F4	LOW EXTRACT
F5	EXTRACT CYCLE
F6	SPLIT EXTRACT CYCLE
F7	PENT (Super Penetration)
F8	OTHER

Pressing the F8 OTHER key access the other drive speeds that are available. They are as follows:

F1	ONE WAY 1
F2	ONE WAY 2
F1	WAS1 is Wash speed 1 for dye machines that are equipped with variable speed drives.
F2	WAS2 is Wash speed 2 for dye machines that are equipped with variable speed drives.

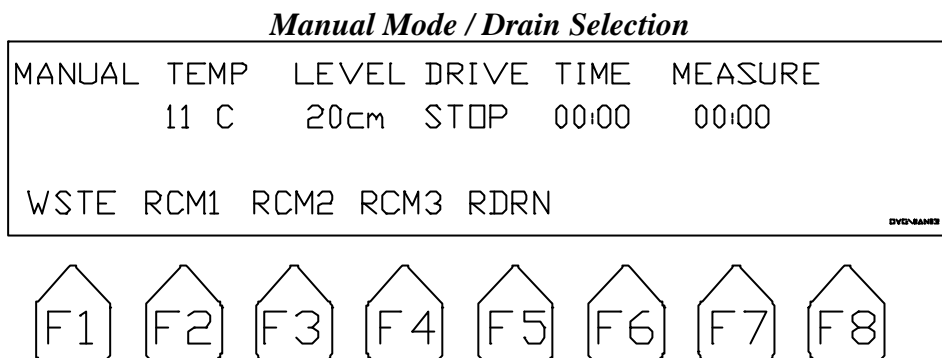
Wash speed 1 & 2 can be set to any speed that is available from the variable speed controller supplied with the dye machine that the Washtech LC102 is fitted to.

F7 PENT is the symbol for Super Penetration Speed. Super Penetration involves running the machine for short periods of time in drain speed with the drain shut to force

the dye into the fabric. Typical times for the drain speed are of the order of 20 - 30 seconds with intervals of wash speed of 1 - 2 minutes between. The drain stays shut during this time.

Drains

Press the DRAIN key and then choose the required outlet: waste, one of the three reclaim outlets or restricted drain (see Manual Mode / Drain Selection). To get back to the normal manual display press the ESC key.



Time

To time a process, press the TIME key on the keypad, the timer starts and the elapsed time is continuously displayed on the screen. Press TIME again to stop the timer. A third press resets and restarts the timer.

Flush Water

Press 'SUPPLY' key to operate the flush output for the chemical injection hopper. The operation of the supply flush is configured by the installer during commissioning. It is able to be operated during the chemical injection and for a time after the flush or only for a time after the chemical injection. The duration of the supply flush after the chemical injection is fully configurable at commissioning.

Stop

Press Stop to stop the machine. The word Stop appears on the display under DRIVE and the washwheel brake activates. The LC102 controller does not allow further operations until the washwheel has slowed down to a complete stop.

Programming Mode

This chapter tells you how to create a new formula and edit an existing one. Select PROG (F4)

from the change mode screen, enter your personal access code and press ENTER.

The first screen you will see is the step in the formula that was last run in AUTO mode. This is the step editing display showing all details about what that step should do.

Press ESC to give you the Choose step display which lists all steps in that formula.

Press ESC again to bring you back to the Choose Formula display (see Program Mode / Choose Formula Display) which is the base point where every other screen branches from.

Program Mode / Choose Formula Display

PRG	1	SHEETS	
Choose formula	> 2	UNIFORMS	<
& Operation	3	MEDI PADS	
PGUP PGDN MOD	NEW	DELT COPY	HELP



From the above display you can select any of the following functions.

Modify Formula	(F3)
New Formula	(F4)
Delete Formula	(F5)
Copy Formula	(F6)

The Programming section is broken up into the following area's and steps you through each sequence as it comes along until the task is completed.

Modify Formula

Instructions for modifying a formula is covered in the following section on New Formula except in the beginning you press MOD (F3) at the choose formula display. Modify the formula Header or a Step as required.

New Formula

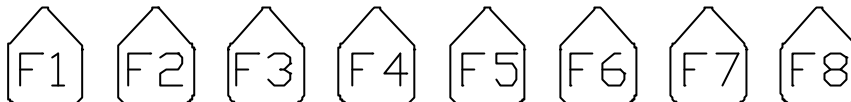
You must be in the Choose Formula Display to start (see Program Mode / Choose Formula Display).

Choose Formula (Create a New Formula)

To create a new formula, press NEW (F4) at the Choose Formula screen. A new screen will be displayed asking you to type in the formula name (see Program Mode / Type in Formula Name).

Program Mode / Type in Formula Name

PR0G	Input name for new	ABCDEFGHIH
form	ula 1 [SHEETS] IJKLMNOP
		QRSTUVWXYZ
ENTER	when finished	YZ/- .



Type in the formula name using the method described in Getting Started / Entering Text. The display then brings up STEP 0 (Formula Header) with the new formula name on it.

Modify Step 0/ Formula Header

Step 0 (Formula Header) (see Step 0 Formula Header) contains details of the formula and is not executed when running the formula. This step cannot be deleted. The following details can be changed:

- Formula name
- Level/volume factor (1-3)
- Stain set protection (Yes or No)
- Rewash (Yes or No)

Program Mode / Step 0 - Formula Header

PR0G	STEP 0	FORMULA NAME/DETAILS
FORM	1	SHEETS
		LEVEL/VOLUME FACTOR (1-3) = 1
F1	:	STAIN SET PROTECT=No
F2	:	REWASH=No

DVD-PROB



Formula Name

To change the formula name, press TEXT. Type the name using the procedures described in Getting Started / Entering Text and when finished press ENTER to save the name or ESC to quit.

Level / Volume Factor

Press LEVEL to change the Level / Volume Factor. Type the number 1, 2 or 3 as required using a numeric key on the keypad and press ENTER. This factor changes the relationship between level of bath and volume of water with respect to the type of product load.

Stain Set Protection

F1 toggles the Stain Set Protection setting for this formula between YES and NO. Stain protect ensures in step 1, cold water is added to a pre-programmed level which is set in SETUP 2 (LEVEL). After that level has been reached hot water, if programmed, can then be added.

Rewash

F2 toggles the rewash setting for this formula between YES and NO. Rewash means that this formula you are creating will become a rewash formula. When this formula is run it will be logged as rewash.

When you are finished with Step 0 (Formula Header) press ESC. The next display is the Choose Step Display.

Create or Modify Step

The next stage to programming a formula is to create or select steps which tells the LC102 how the wash should run.

Program Mode / Choose Step Display

PROG	FORM #	>	0	FORMULA NAME/DETAILS	<
Choose step			1	BREAK WASH	
& operation		L		End of formula	J
PGUP	PGDN	MOD	NEW	DELT	



To create a new step press NEW (F4), the new step will be added before the step that the pointer is currently on.

Step Names

You can select a step name from the alphabetical library list of pre-written names by highlighting the step name you want with the pointer and then press ENTER (see Program Mode \ Formula Step Names).

Program Mode / Formula Step Names

PROG FORM 4	>	1	BREAK WASH	<
NEW STEP 1		2	FIRST RINSE	
Choose name		3	MAIN WASH	
PGUP PGDN		4	FINAL EXTRACT	



You can also write a new name and add it to the library by pressing TEXT (see Program Mode / New Step Name) and following the procedures in Getting Started / Entering Text. You will be asked to confirm your new step by pressing F1. You may now select your new step name from the list by pressing ENTER.

Program Mode / New Step Name

PROG NEW STEP LIBRARY NAME	ABCDEFGHIH
[] IJKLMNOP
(184 MORE NAMES POSSIBLE)	QRSTUVWXYZ
ENTER WHEN FINISHED	YZ/- .



You cannot delete a step name in the step library. A maximum of 199 formula steps names can be held in memory for later use. The only way to change step names in the Washtech LC102 is to connect it to the Washlink Network and edit the step names.

Delete a Step

To delete a step which may not be necessary in the formula press DELT (F5) and press F1 to confirm your deletion.

Deleting of steps can only be done at the choose step display.
To Continue to the next stage of Editing a Step highlight the step you wish to edit with the pointer and press ENTER.

Editing a Step

When editing a step you can create or modify any of the following area's to suit your formula :

LEVEL SETTING

TEMPERATURE SETTING

TIME SETTING

COLD WATER

HOT WATER

STEAM INJECTION

DRAIN SELECTION

DRIVE SELECTION

REUSE INLETS

OPERATOR SIGNAL

CHEMICALS: AUTOMATIC SUPPLIES

 MANUAL ADDITIVES

PROGRAMMING COOLDOWN

Program Mode / Typical Step Editing Display

PROG	STEP 7	MAIN WASH					
FORM	1	cm= 25	C=25	Tm=0:03:00	Dr=WASH		
HOT	COLD		SOAP				
			5.500			HELP	<small>DVD-VIDEO</small>



Level Setting

Press the LEVEL key and then enter a value with the numeric keys between the square brackets, for example:

cm = [15]

Press ENTER to accept the value.

Press CLEAR to remove the programmed level altogether. This is indicated by:

cm = [...]

Temperature Setting

Program Mode / Temperature Display

PROG	STEP	7	COOLDOWN				
FORM	1		Gradient [-5.5]C/min			
			Target Temp=	30 C			
GRAD	TEMP		Sign	DePt		HELP	<small>PLS/PRG</small>



To program the target temperature for this step, press **TEMP** and this will bring up the Temperature programming display (see Program Mode / Temperature Display).

Press **F2** to program the temperature that is required if the step is a straight heating step. Press **F1** to program the Gradient if the step is a ramped cooldown or a ramped heat up for Polyester garments or a Dyeing process.

Use the arrow keys and numeric keys to edit the temperature value between the square brackets which appear, for example:

Target Temp = [30]C
Gradient [0.0]

You will notice that when the gradient is selected a **Sign (F5)** and **DePt (F6)** will appear at the bottom of the display. These will enable the setting of a negative Gradient (**Sign**) and the Decimal point (**DePt**) for accuracy.

To remove a pre-set value in either Gradient or temperature press **CLEAR** to remove the programmed temperature or Gradient. This is indicated by:

Target Temp = [0]
Gradient = NONE

Time Setting

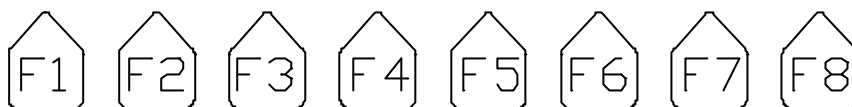
To program the time of this step, press **TIME** and enter the time using the numeric keys. Press **CLEAR** to set the time to zero.

Time is configured like this (H:MM:SS)

Cold Water

Program Mode / Programming Cold Water

PROG	STEP	1	BREAKWASH
FORM	1		Toggle values
Off	Off		
COLD	RCLD		



Press COLD to program cold water, the cold water programming display will come up on the screen (see Program Mode / Programming Cold Water).

The F1 and F2 keys become active as follows:

- F1 Toggle COLD on and off
- F2 Toggle RCLD (Restricted Cold) on and off

Press ESC to return to the step programming screen.

Hot Water

Pressing the HOT key toggles the hot water inlet on and off. Hot water on will be shown as HOT on the step edit display and hot water off will show nothing on the display.

Steam Injection

Pressing the STEAM key toggles the steam inlet on and off. Steam programmed will be shown as STEAM on the step edit display. The Steam injection is able to be configured to operate while the chemicals are being added to the machine. The Steam will be injected until the minimum level for steam is attained.

Drain Selection

Pressing the DRAIN key will display the (Program Mode / Drain Section Display).

Program Mode / Drain Selection Display

```

PROG  STEP 3 FIRST RINSE DRAIN
FORM  1          Toggle values
On    Off  Off  Off  Off  Off
WAST REC1 REC2 REC3 HTEX RDRN      HELP

```



Use the function keys (F1 to F6) to toggle the drain valves on and off.

The different Drain selections are :

F1	WASTE DRAIN
F2	RECLAIM DRAIN 1
F3	RECLAIM DRAIN 2
F4	RECLAIM DRAIN 3
F5	HEAT EXCHANGER
F6	RESTRICTED DRAIN

Press ESC to return to the step programming screen.

Drive Selection

Pressing the DRIVE key displays the Drive Selection Display. Then use the function keys (F1 - F7) to program the drive as follows:

Program Mode / Drive Selection Display

```

PROG  STEP  1 BREAKWASH
FORM  1          Choose drive

STOP  GNTL WASH DRAN EXT1 EXT2 SPEX HELP

```



F1	Stop
F2	Gentle Wash e.g For Woollens or Delicates
F3	Wash
F4	Drain/Balance
F5	Low Extract (Extract cycle to Ext 1 only)
F6	High Extract (Extract cycle to Ext 2)

ReUse Water

Press REUSE to display the Reuse water Inlets Display. Then use F1, F2 or F3 to toggle one of the three reuse inlets on and off as required.

Program Mode / Reuse Inlets Display

PROG	STEP	1	BREAKWASH	
FORM	1		Toggle values	
<input type="checkbox"/> ff	<input type="checkbox"/> ff	<input type="checkbox"/> ff		
RUS1	RUS2	RUS3		HELP <small>F4/F8/PRG</small>



Press ESC to return to the step programming screen.

Operator Signal

Program a signal to display a message to the operator.

Program Mode / Operator Signal Display

PROG	STEP	5	MAIN WASH	ABCDEFGH
FORM	1	[] IJKLMNOP
Signal				QRSTUVWXYZ
ENTER	when	finished		YZ/- . <small>F4/F8/PRG</small>



A single message can be up to 40 characters long. To remove a signal from a step, clear the entire message using the CLEAR key. When a signal is programmed in a step, the abbreviation SGNL is displayed on the step programming screen.

Edit Signal

Press SIGNAL to bring up the previous screen and follow the procedures for entering text in Getting Started.

To remove a signal from a step, clear the entire message using the CLEAR key.

When a signal is programmed, the abbreviation SGNL is displayed on the step programming screen.

Chemical Supplies

Press the SUPPLY key on the keypad and then F1 to set an automatically added supply or F2 to set a manually added supply.

Program Mode / Auto Supplies Display

PROG	STEP 7	MAIN WASH						
FORM	1	Choose supply						
		SET						
ALK	DET	SOAP	SOFT	SOUR	BLCH	OTHR	HELP	<small>DVD-HELP</small>



After you have selected auto supplies you will be shown a list of all supply abbreviations across the bottom of the screen (see Program Mode / Auto Supplies Display).

Select the supply you want to be automatically added in the formula step by pressing any of the corresponding (F1-F6) keys or OTHR (F7) to give the remaining two supplies.

You are then asked to enter the amount of supply you require in litres. If you need to use a decimal point press the (F6) key, press ENTER to confirm your supply. Once your supply has been entered you will see a message above the supply abbreviation saying SET

You may then choose another supply or press ESC to go back to the step edit screen where the supply and quantity will be shown (see Program Mode / Supply Confirmation).

```

PROG  STEP 7  MAIN WASH
FORM  1  cm= 25  C=25  Tm=0:03:00  Dr=WASH
HOT  COLD          SOAP
                    5.500
                                HELP

```



The Washtech LC102 will work out how long to turn the pump on for from the flow rate programmed for each Automatic supply in Setup 2 (Supplies).

Auto Flushing

The Washtech LC102 is equipped with an automatic output that is for connection to the flush solenoid on the supply hopper or manifold. This output operates automatically whenever a chemical is injected. During the installation of the Washtech LC102 the installation technician will configure the Auto Flush output.

It is possible to configure whether or not flush operates during the injection of the chemicals. The time that the flush continues after the chemical is completed is configured in Setup 1 Time.

Manual Additives

After you have selected manual additives F2 you will be shown a list of all supplies (see Program Mode / Manual Additive Display). The operator will be signalled should a manual additive be programmed.

Program Mode / Manual Additive Display

```

PROG  STEP 7  MAIN WASH
FORM  1          > ALKALINE          <
Choose additive  HYPD
PGUP  PGDN          BRIGHT

```



Select the supply you want to be manually added into the machine with the cursor keys and press ENTER to confirm.

Type in the amount of chemical you want in litres, Kg's etc. DePt means decimal point which is obtained by pressing (F6)

Press ENTER to confirm your supply. once your supply has been entered the screen will go back to the step edit display where you will see the supply and the amount you wanted below it (see Program Mode / Supply Confirmation).

Programming Cooldown

To program a cooldown step all that is required is to program a negative temperature gradient for the step. The cold water inlet and the waste drain will be selected by default. If the machine is fitted with a restricted cold water inlet or a restricted drain valve you can change to these by pressing the cold or drain keys and toggling the required cold or drain valve. The operation of the cooldown is controlled by the Washtech LC102. The cold water inlet will be turned on for a short time to lower the temperature to the ramp target temperature.

When the machine has filled to the cooldown overlevel trip the drain valve will dump some of the water and the cooldown will continue.

This process will be repeated until the temperature has dropped to the programmed temperature.

Delete Formula

To delete a formula select the formula you wish to delete by highlighting it with the pointer. Use the cursor keys to move the pointer. Press DELT (F5), you are now asked to confirm the deletion by pressing F1 (see Program Mode / Delete Formula Display), any other key will cancel the DELETE command.

You are then taken back to the Choose Formula Display where that formula is now non-existent.

Program Mode / Delete Formula Display

```
PRQG About to DELETE
Formula # 3 COTTON MATS

F1 to CONFIRM, any other key otherwise
```



N.B Once a formula is deleted it is gone forever and cannot be retrieved again. If the machine is on a Washlink Network the formula will be deleted from the network as well.

Copy Formula

To copy a formula, highlight the formula you wish to copy with the pointer and press COPY (F6). The new formula will be given the next available formula number and will retain the same name.

Diagnostics

The Diagnostics section is used to access memory backup systems and for recalibration of temperature and level via software.

Diagnostics is accessed by selecting the MODE key, pressing (F5) and Entering your access code.

Diagnostics / Main Menu screen



NOVRAM (F1)

This option reduces the step database inside the LC102 to hold only 325 steps. This is only if the software version is changed from a version higher than 4.13 to lower than 4.13.

EVENT (F2)

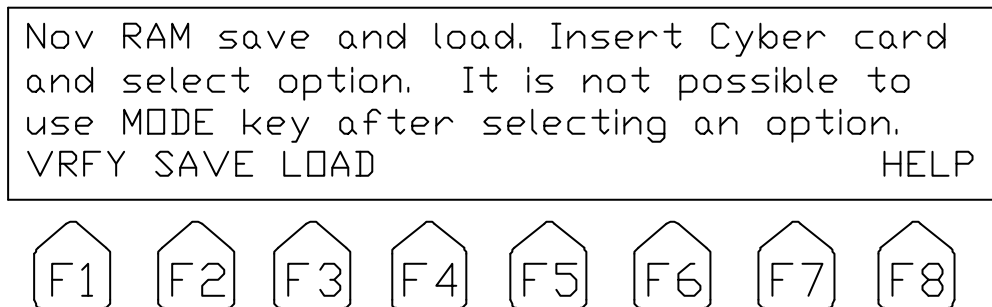
This option fills the event database with false or test events. The is used in conjunction with the Washlink Network system.

CYBER (F3)

The Cyber card option allows the entire memory of the LC102 including all timers, setup information and formulas to be backed up onto separate memory card.

Selecting the Cyber card option will bring up a new menu screen shown below.

Diagnostics / Cyber Card Menu Option Screen



Saving the LC102 Memory to Cyber card.

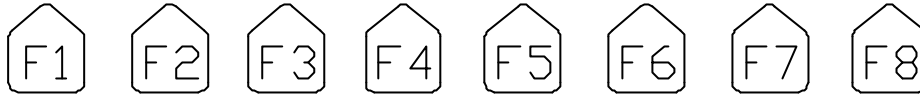
Insert the Cyber card in the special Cyber card socket located on the top relay board.

Press the SAVE (F2) key from the Cyber card Menu Option Screen.

The LC102 will compute a check sum and then begin to save the memory to the Cyber card.

Diagnostics / Cyber card backup progress screen

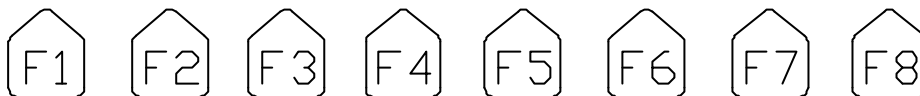
```
DIAGNOSTICS
Saving to Cyber card. . . 33% done
```



When the display reads 100% and the checksum has been verified, the LC102 will offer a new set of options (see below).

Diagnostics / Operation Successful screen

```
DIAGNOSTICS
Operation Successful
Press ESC to re-start LC102 or F1, F2, F3
VRFY SAVE LOAD
```



STOP / ESC will restart the LC102, F1 to Verify, F2 to SAVE or F3 to Load.

Loading the Cyber card into the LC102 memory.

Insert the Cyber card in the special Cyber card socket located on the top relay board.

Press the LOAD (F3) key from the Cyber card Menu Option Screen.

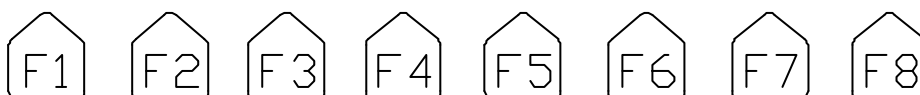
The LC102 will display a verification screen to make sure that this the option you want.

!!!! WARNING !!!!

Loading data from the Cyber card will overwrite the entire memory of the LC102.

Diagnostics / Cyber Card Load verification screen

```
DIAGNOSTICS
Loading from Cyber card will replace
all formula and machine setups. Press F1
to continue. Any other key exits.
```



Once you have verified you want to load all Cyber card contents into the LC102 you will see the following screen showing the Cyber card loading progress.

Diagnostics / Cyber Card Loading Progress screen

```
DIAGNOSTICS
Reading Data from Cyber Card. . . 57% done
```



If the loading operation was successful you will see the following screen and will be able to choose from the available options.

Diagnostics / Operation Successful screen

```
DIAGNOSTICS
Operation Successful
Press ESC to re-start LC102 or F1, F2, F3
VRFY SAVE LOAD
```



STOP / ESC will restart the LC102, F1 to Verify, F2 to SAVE or F3 to Load.

DELETE (F4)

Diagnostics / Delete Option verification screen

DIAGNOSTICS

Press F1 key to delete all formula and steps. WARNING : all formula will be lost. ESC will exit now without deletion.



CALIBRATION (F5)

Calibration should be done via the Analogue Input board. See Service Manual for instruction.

Configuring the System

The LC102 controller has two configuration levels known as Setup 1 (Installation) and Setup 2 (User Sector).

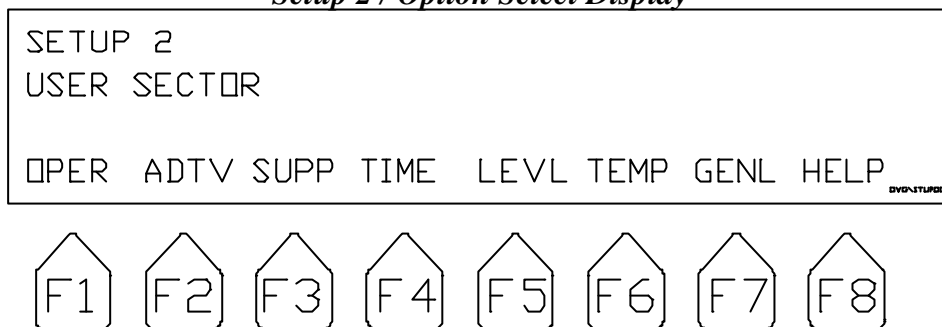
Setup 1

Setup 1 is for fundamental settings and is accessed at the time of installation or for diagnostic purposes. This mode can only be accessed using a special security code. Initial setting of the operator passwords can be done at this time as well. Further information is given in the Washlink / LC102 Service Manual.

Setup 2

Setup 2 provides facilities to edit information held in the memory of the controller.

Setup 2 / Option Select Display



- × Operator access codes (also in Setup 1)
- × Additive Supplies
- × Time, Level and Temperature settings
- × General conditions

To get into Setup 2, go to the mode change screen and press SET2 (F5) (see Changing Mode). You are required to enter your access code.

Note: The personal access codes themselves can be assigned in Setup 1 or Setup 2.

Operators

This section provides editing of the three digit personal codes which allow operators to use the various modes of the LC102.

```

SETUP 2      > ***** LAUNDRY MANAGER
OPERATORS    ***--- OPERATOR 1
ALL MODES    **---- OPERATOR 2
PGUP PGDN MOD NEW DELT DSPL      HELP

```



The asterisks indicate the modes assigned to a particular user. To display the access codes instead, press DSPL (F6) and change the display mode to CODES by pressing the SIGNAL key.

For a new operator, press NEW (F4) and enter the name using the methods described in Getting Started / Entering Text.

To change the modes assigned to an operator, scroll to the name on the list and press MOD (F3).

Setup 2 / Assign modes to an Operator

```

SETUP 2      CODE:[###]
OPERATORS    OPERATOR 1
  Yes  Yes  Yes  -    -    -
AUTO MOVE MANL PROG  DIAG SET2 CODE HELP

```



Press the corresponding F key to toggle the assignment of a mode. The operators code is not shown because it is their personal code for accessing certain modes in the LC102.

As per example, operator 1 is only allowed to access AUTO, MOVE and MANUAL modes.

Additives

This option allows you to add new entries to the library of supply or additive names, assign four letter abbreviated names and set the units to be used when metering the additive.

Setup 2 / Supply/Additive Display

```

SETUP 2 Choose > 1 ALKALINE <
SUPPLY/ADDITIVE 2 BLEACH
& operation      3 DETERGENT
PGUP PGDN MOD NEW DELT HELP

```



To add a new additive, press NEW (F4) and enter the name using the method described in Getting Started / Entering Text.

To change the name, abbreviated name, or units, scroll to the required additive and press MOD (F3).

Note: You can't change the Additive Database if the Setup 2 (GEN) option Washlink Permanent Connect is set to Yes. You must not edit the supply additive database by changing the Setup 2 option because the changes will not be unloaded to the network.

Modify Supply / Additive Names

```

SETUP 2 SUPPLY NUMBER: 1
SUPPLY/ ABBREVIATION: ALK UNIT: l
ADDITIVE NAME: ALKALINE
ABRV NAME UNIT HELP

```



Select ABRV (F1), NAME (F2) or UNIT (F3) to change the corresponding feature.

Supplies

Setup 2 / Supply Connections

```

SETUP 2
SUPPLY      Choose connection F1 . . F6 ;
CONNECTIONS or F7
ALK  BLCH DET  SOAP SOFT  SOUR  OTHR  HELP

```



This option allows you to assign supplies to function keys, connections and flow rates for supplies, and to set up flow rates for each supply connected.

First select a connection by pressing (F1-F6) or OTHR to obtain the 7th and 8th supply.

Setup 2 / Configure Supply

```

SETUP 2
SUPPLY      Choose operaton F1.....F3
CONNECTION  F1 <ALKALINE> 100.00 l/min
SUPP  FLOW DELT
HELP

```



Press SUPP (F1) to change a supply connection.

Access the Flow rate of the pump which supplies the chemical by pressing FLOW (F2). Use the numeric keys and (F6) decimal point to enter flow rate in

litres per minute. To delete the supply press DELT (F3) and then F1 to confirm deletion.

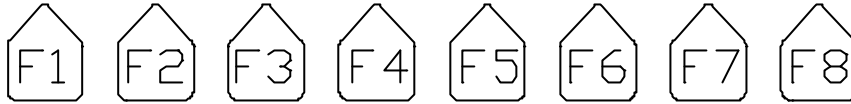
Press ESC until you are back in the SETUP 2 selection screen.

Times

Times can be configured as shown in the diagram below.

Setup 2 / Times Display

SETUP 2	> Temp Short Display Time	02.0 <
TIMES	Temp Long Display Time	08.0
	Level Attain Timeout	10:00
PGUP PGDN	Temperature Attain Timeout	10:00



Select from the list and then enter the time required.

Press ENTER to confirm selection.

Press ESC until you are back in the SETUP 2 selection screen.

Levels

Setup 2 / Levels / Volumes

SETUP 2	> Lower Level Tolerance cm	2 <
LEVELS	Min Level for Steam cm	4
	Stain Set Cold Min Level cm	4
	Min Level for Supplies cm	4



SETUP 2	> Extract Retry Level cm	30 <
LEVELS		



Select from the list then enter the level required.

Press ENTER to confirm selection.

Press ESC until you are back in the SETUP 2 selection screen.

The Extract Retry Level is used when the machine has gone out of balance. The LC102 will fill the machine back upto this level and try to go through the Extract sequence again.

Temperatures

Setup 2 / Temperatures

SETUP 2	> Lower Temp Tolerance C	2<
TEMPS	Temp Gradient Sample Tm (sec)	10
	% Tm Steam on / degree error	20
PGUP PGDN	% Tm Cold on / degree error	20



Second temperature display. This is displayed by pressing the page down key (F2).

Setup 2 / Temperatures 2

SETUP 2	> % Tm Steam on / degree error	20<
TEMPS	% Tm Cold on / degree error	20
	% Tm Integral Gain (0==>no Int)	10
PGUP PGDN	Differential Gain (0=>no diff)	3



Highlight the setting you wish to change with the cursor keys, press ENTER to be able to change the setting and press ENTER again to confirm new setting.

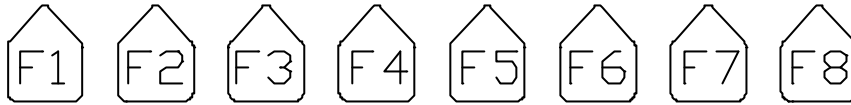
Temperature Gradients are now available for all machines and can be used to ramp the temperature up at any programmed rate (provided that the machine is able to comply with the rate that is set) or to cool the machine down once again at any rate of change. This feature will be very useful to those people who are washing poly cotton fabrics or who are using their machines for dying.

Press ESC until you are back in the SETUP 2 selection screen.

General Conditions

Setup 2 / General

SETUP 2	OpCde for Formula Start	Yes
GENERAL	Get Weight at Formula Start	Yes
	Washlink permanent connect	No



Use this screen to configure the following options:

Whether or not the operator is required to enter their access code or not when starting a formula in Auto Mode.

Whether or not the operator is required to enter the load weight or not when starting a formula in Auto Mode.

Whether or not the Washtech LC102 is connected to a Washlink Network System permanently.

Move the pointer to the required setting and press ENTER to toggle YES / NO.
Press ESC until you are back in the SETUP 2 selection screen.

Backup Storage

The LC102 can be connected to a portable PC or laptop computer and data transferred either way. This facility can be used to transfer formulae and configuration data from one system to the next or to transfer statistical data to a computer system for management reporting purposes.

An advantage of this facility is that formulae can be prepared on a computer away from the distractions of the washroom and transferred to the wash floor when needed, with no interruption to production.

Once transferred to a computer, data can be printed or saved on magnetic media for permanent storage.

See LC102 SERVICE MANUAL for further details on cable connection and address setting on V25 board.

Specific Machine Information

The next section gives you the specific installation differences between each of the machines. Each machine is listed and gives an explanation about the variances in each of the machines to look out for when attempting a Washtech LC102 installation.

Machine Types Available

Braun 200lb with DC brake
Braun 200lb no DC brake
Cherrytree TSL 600 \ Broadbent
Spencer 350
Spencer 750
Washex
Washex Dye
Milnor
Cascadex
Wascator

Selection of one of the above Machine types will load a standard set of instructions for the operation of that machine type. This will include default timers and drive types. After selecting the machine the installer will check through the items in Setup 1 and ensure that they are suitable for the individual machine.

The following sections detail the differences for each special machine types.

Braun 200 with DC brake

The Braun 200 with Dc brake is an open pocket machine. It has three drive speeds these are as follows :

Wash (Forward & Reverse)
Drain or Balance
Extract

This machine type does not have a high extract speed. Do Not program High Extract on the *Washlink* Network System. The machine is equipped with a DC braking system that injects a DC voltage into the Extract motor to bring the machine to a stop after the extract has finished. This should only take about 60 Seconds.

Braun 200 no DC brake

The Braun 200 no Dc brake is an open pocket machine. It has three drive speeds these are as follows.

Wash (Forward & Reverse)
Drain or Balance
Extract

This type of machine generally has a pendulum situated on the left hand side behind the

machines main front plate. This pendulum is to detect an out of balance situation when it goes into extract.

The pendulum has two hold in plungers to keep it steady when it not being sensed. When the Washtech LC102 wants the machine to go into extract it will engage drain/ balance speed, release the pendulum and check it for approximately 7 seconds to see if there is any excessive movement in the machine, if all is clear the pendulum hold plungers are engaged and the machine will safely move into extract.

Cherrytree TSL600 / Broadbent (Brauns)

The Cherrytree TSL 600 the Broadbent and Brauns are three different machines that just happen to operate in a similar manner and therefore share the same software setup.

Cherrytree TSL 600 and Brauns

The Cherrytree TSL 600 and Braun Machines are a three pocket washer extractor. It has three drive speeds and they are as listed

Wash (Forward & Reverse)

Low Extract

High Extract

During the normal course of a wash formula the draining of the machine is done in wash speed for all of the steps where a drain is required. You must program a drain step before an extract step for this machine type. It is not necessary to program the waste drain for this to operate as the instruction for the waste drain is built into the extract sequence of events. If the machine is drained in wash speed before an extract it will most likely not balance correctly due to no distribution of load.

The Broadbent

The Broadbent is an open pocket washer extractor. It has three drive speeds and they are as listed

Wash (Forward & Reverse)

Low Extract

High Extract

During the normal course of a wash formula the draining of the machine is done in wash speed and for the extract steps of the cycle the drain is done from a high level (50cm) when the low extract drive is on. It is not necessary to program the waste drain for this to operate as the instruction for the waste drain is built into the extract sequence of events. If the machine is drained in wash speed before an extract it will most likely not balance correctly.

Spencer 350

The Spencer 350 is generally a three pocket washer extractor but there are several examples of the open pocket versions of this machine available. The Spencer 350 has dynamic balancing of the inner drum while the machine is in extract. The Washtech LC102 has complete control of this balancing.

The duration of the balance water injection are fully variable as are the pocket full times. The door locking system of the 350 Spencer requires that air be applied to the door pin to release it and allow the door to be opened.

Spencer 750

The Spencer 750 is a three pocket washer extractor. The Spencer 750 has dynamic balancing of the inner drum while the machine is in extract. The Washtech LC102 has complete control of this balancing. The duration of the balance water injection are fully variable as are the pocket full times.

Spencer Machines all have the same type of drive speeds and they are as follows:

Wash (Forward & Reverse) (Wash speed is drain speed)

Balance / Interspin

Low Extract

High Extract

The door pins of the 750 Spencer require air to be applied to the manual switch in the middle of the door before they can be released. This air is supplied by the door lock solenoid. The door seal is controlled by the Washtech LC102 and is operated when required. Spencer's have a centrifugal clutch that will automatically engage and disengage at certain revolutions.

Washex

The Washex machine is available in a wide range of configurations and sizes. The Washtech LC102 is able to control most of the machines that are available from this manufacturer as the original software was developed for this machine and adapted for the other types of washer extractors.

The Washtech LC102 has the facility to provide control of the Auto jogging that is available in the newer Washex Washer extractors using the wash motor running at low speed.

The Washtech LC102 has the full range of drive speeds available for the Washex Washer extractors in either floataires, fixed mounts or open pocket machines.

Be aware when dealing with Floataire machines cushion machines that they use a combination of valves and switches to operate the floataire system. The common names for these valves are FA, RAM, LAM, RAV, LAV and the two limit switches on either side of the machine sensing the machine height.

To engage the floataire system you first engage RAM, LAM and FA, when the left hand limit switch has been activated i.e. the left hand side of the machine has reached it's correct height disengage LAM, when the right hand limit switch has been activated disengage RAM. This will leave FA going all the time to provide air to the special levelling valves at both ends. To deflate the bags, disengage FA and engage LAV and RAV.

Washex Dye

The Washex Dye Machine Incorporates all LC102 design features for it's complex operation. The Washex Dye Machine is able to be tilted forward so it maybe loaded and airbag facilities for extracting. The Door is pneumatically sealed to the front of the machine. The door locking and sealing of the Washex Dye is fully automated and only requires the operator to press the stop key for sufficient time to allow the door seal to be deflated and the pins to retract but only if the level is lower than the maximum door level.

The machine has an external Speed controller for wash speed and the drive speed called Super Penetration which is used to force dye into the fabric.

Milnor Machines

The Washtech LC102 is capable of controlling the complete range of Milnor Washer extractors including those machines that are fitted with a balancing and tilting systems.

Some small Milnors only have one extract speed, so when it comes to programming extract cycles on the LC102 or *Washlink* the final Extract Speed is Extract 1 (Low Extract).

The door locking and sealing of the Rapid load machines is fully automated and only requires the operator to press the stop key for sufficient time to allow the door seal to be deflated and the pins to retract.

The Washtech LC102 can use either the original speed switch or a pulse input from a proximity switch to detect the speed of the drum while the machine is operating. The Milnor Machines are supplied from the factory with a mixture of solenoid voltages and the installer needs to be aware of this.

The Milnor Door

The operation of the Milnor door system for Rapid Load machines and / or D Pocket machines has retained the original operating principal. To open the door the machine must be powered up. The operator only has to push the Stop button for the duration of the Seal Sucker timer.

When this timer has timed out the Door Pins will retract and the operator can release the stop button and open the doors. The pins will stay retracted for a short time and will return to their normal position after this. If the door is not opened in this time the operator will have to go through the operation again. It is not possible to open the door while there is water in the machine above the max door open level.

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Cascadex

There are two types of Cascadex machines. One is a pocketed machine that operates in the same manner as a fixed mount Washex. The other Cascadex machine that we have controlled is an open pocket machine that operates in the same manner as a Washex Dye machine. The open pocket tilts forward to unload and has a pneumatically driven door. This machine lifts up onto its airbags when extracting. To open the door of this machine you have to press the stop key for a few seconds. If the level in the machine is below the maximum level for door open the seal will deflate. The door pin will now retract and the door can be opened.

When controlling Cascadex machines identify whether it operates like a fixed mount Washex or Washex Dye machine and choose the appropriate software,

Wascator

The Wascator machine that generally does not have a braking system. Wascator's have electrically operated clutches. These machines operate in the same way as a Washex Fixed Mount. They use the low extract motor to slow the machine down from high extract and glide

down to stop from there.

Trouble Shooting Section

This Fault Section is written to aid you in restoring or correcting a problem you may have with the Washtech LC102.

This fault section is divided into 2 sections:

Washtech LC102 Faults 'Reported to Screen' :

These are screen fault messages which are prompted by the Washtech LC102 when it has detected something wrong with the LC102 or the machine.

Washtech LC102 Faults 'Not Reported to Screen' :

these are faults that are not displayed as a message on the screen and are usually caused by damaged hardware inside the LC102.

Please use this fault section to determine and correct the fault. If for any reason the fault cannot be rectified call

Total Systems Control Ltd
Auckland
New Zealand
Ph: 09 378 1315 Fax: 09 378 9046

To enable the best use to be made of the telephone servicing You must be able to tell us several facts about the Washtech LC102 fault first, to help us determine what the problem might be.

Follow this check list and write down the information and have it in front of you when you ring us.

- 1 In your own words describe the fault that has occurred.**
- 2 What part and at what stage of the wash cycle does the fault occur, i.e. Temperature, Drive, Level etc.**
- 3 What is the actual error message displayed on the screen, write down the message on the display exactly if there is one.**
- 4 Is this the first time the fault has occurred; if not how many times and at what point in a wash cycle or time of the day does it happen.**

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Trouble Shooting Section

Washtech LC102 Faults ‘Reported to Screen’

“NO AIR PRESSURE”

This fault indicates that the air pressure switch input (03) has registered a low air pressure. Check the pressure switch and all gauges to see if this is correct, resume the program when the air pressure is back to normal.

“AIR BAGS TIME-OUT”

This fault indicates that either the machine did not inflate or deflate to it’s correct height in the time allowed (Timer 37). The airbag limit switches which read if the machine is at the correct height or not are inputs (04 Left hand side & 05 Right hand side). These switches must be wired normally closed. When both sides of the machine are safely down on the ground inputs (04 & 05) should be OFF, when the machine is safely suspended on it’s airbags waiting to go into extract inputs (04 & 05) should be ON.

Also check all airbag valves including exhausts for blockages.

“BRAKE FAULT CALL ENGINEER”

This fault is generally associated with the Washex machines. If the machine has a brake worn limit switch this fault will occur when the brake has pads need replacing. The Brake worn limit switch is wired into input (10) when the machine is configured as a Washex.

“DOOR OPEN”

This fault indicates that input number (01) door switch(s) has been tripped, telling the Washtech that the door(s) are open. Check all doors and door switches.

“DRAIN BLOCKED”

When the Washtech goes into extract with a full load, the load will start expelling it's water. If the water level rises higher than the (Maximum Level for Extract) configuration setting in Setup 1 Levels, then this fault message will be displayed and the machine stopped. Check the drain is not actually blocked and is open. If this happens frequently then increase the maximum level for extract by 3 or 4 cm.

“CANNOT REACH PROGRAMMED LEVEL”

The Washtech LC102 has a time-out facility where it must reach the programmed level by the time set in Setup 2 Time (Level Attain Time-out) if it does not then this fault message will occur.

If the machine is trying to fill to a level, check all water inlet solenoids and the valves for correct operation. If the machine is trying to drain then check to see if the drain is blocked or if water is still coming out of the drain. If everything checks out then maybe the zero level needs recalibrating (see Washtech Level Calibration in this manual). Another possibility is the level reading system may have a leak in it so the correct water level is not read.

“CANNOT REACH PROGRAMMED TEMPERATURE”

The Washtech LC102 has a time-out facility where it must reach the programmed temperature by the time set in Setup 2 Time (Temperature Attain Time-out) if it does not then this fault message will occur. Check to see if the steam injection system is operating correctly. Check to see that the temperature on the screen is the same as the temperature inside the machine using another thermometer. This may also be due to steam demand, if the boiler is over stressed and cannot supply enough steam to the whole plant as well as the washer.

“CANNOT BALANCE POCKET 1 2 OR 3”

This fault refers to Spencer or Balancing Milnor machines. The Washtech LC102 has tried to inject water into the offending counter balance pocket for the maximum time allowed without success. The maximum time allowed to try and balance a single pocket is found in Setup 1 timers (Timer 34). Check for badly loaded machine and check to see if balancing system is working correctly. Out of balance Inputs - Pocket 1 = Input (09), Pocket 2 = Input (10), Pocket 3 = Input (11), Water injection Outputs for Pocket 1 = (46), Pocket 2 = (47), Pocket 3 = (48). Check the Balance commutator as well for carbon build up on the brushes.

“CHEMICAL DOOR OPEN”

This fault refers to Washex Dye machine configuration. The chemical door usually has a proximity sensor on it which detects if the door is open or closed. If the door is sensed open the Washtech LC102 will not allow the machine to run. Check the chemical door, make sure it is closed properly. Input (11) reads the chemical door on machines configured to Cascadex or Washex Dye.

“CYBER CARD REMOVED OR FAULTY”

When you are trying to use the Cyber card for memory backup or download this fault will occur if the Cyber card is either not in the Cyber card socket, it is not correctly inserted or there is a problem with the Cyber card you have. Check to see that you have the Cyber card in the socket and that it is inserted correctly.

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“EXCESSIVE VIBRATION”

Each machine will have an excessive vibration switch which is located in a position to sense the excessive movement of the machine relative to its mounting position.

This switch is seen as Input (06). Check for correct loading of the machine, faulty shock absorbers or springs, faulty vibration switch or mounting.

“EXCESS WATER LEVEL”

The Washtech LC102 has a configuration setting in Setup 1 Levels (Excess water Level) that will stop the machine and bring up this fault whenever this level is reached in normal operation of the machine.

Check that the water outputs (25 & 26), solenoids and valves are operating correctly.

“DRIVE REPORTS RPM SENSOR FAULT”

This fault will occur if the Washtech sees that the inner drum of the machines not turning when it should. Reasons for this fault could be :

The Safe Run switch still set to SAFE.

The speed sensor or cable is damaged and not picking up the pulley spokes as it moves around.

The control voltage to the contactors has been disrupted somewhere.

The 24 VDC has been lost to the output relays. See Relay Output Faults.

The contactor coil maybe faulty.

The clutch may not have engaged.

The brake may not have released.

Vee belts are slipping on the pulley.

SPEED SENSOR PARAMETER FAULTS

An example of the type of error message you'd expect to see is ;

----- **FAULT** -----
**CW WASH drive did no accel to 20 RPM
in 5.0 secs (Timer 14):Speed was 18 RPM**
-----**PRESS STOP**-----

This fault says that when CW Wash drive was engaged (Output number 11) on the LC102 did not see the machine get to the Wash Min Speed of 20 RPM in the time that it was allowed to of 5 seconds which is timer 14. The speed when it was tripped was 18 RPM.

To correct this fault you must first ascertain why the fault occurred, whether it was mechanical, electrical or the controller. This fault if it occurs several months after an installation generally indicates either the sensor has moved out of range of the pulley due to vibration or possibly a wearing part on the machine that needs attention.

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Trouble Shooting Section

The control voltage to the contactors has been disrupted somewhere.

The contactor coil maybe faulty.

The clutch may not have engaged.

The brake may not have released or not be able to slow the machine down fast enough.

Vee belts are slipping on the pulley.

See section in this manual on DRIVES (Setup 1 Configurations).

“SPEED SWITCH STAYED CLOSED”

This fault refers to the zero speed switches found on early models of machines which have not had the new speeds sensors installed. The fault says that the zero speed switch input (08) stayed closed after an allowed time (timer 35) when it should have opened because the machine should have accelerated enough to attempt an extract cycle.

“SPEED SWITCH STAYED OPEN”

This fault refers to the zero speed switches found on early models of machines which have not had the new speeds sensors installed. The fault says that the zero speed switch input (08) stayed open after an allowed time (timer 35) when it should have closed because the machine should have slowed down enough from an extract cycle.

“MOTOR OVERLOADED”

This message indicates that the overload input (02) has tripped while the machine was running. The report will also tell you what overload has tripped whether it was Wash, Drain, Low Extract or High Extract.

Check the appropriate overload, reset the overload trip. This could be due to overloading of the machine, something stopping the motor from turning freely or even a tired motor.

“WATCHDOG REPORT POWER FAULT”

This fault tells you that a special circuit inside the Washtech LC102 called a Watchdog has picked up a power fault. It could be a brownout, blackout or a power spike which has knocked over the main processor board. The Washtech LC102 had to reset itself to counter act it.

No action is necessary at his stage. Keep an eye out to see if this fault occurs frequently. If it does occur frequently then you may have power supply problems to the machine.

Washtech LC102 Faults 'Not Reported to Screen'

LEVEL FAULTS

The level display reads 0 cm or is slipping but machine is filling.

- The level pressure system is very sensitive, the pressure sensor on the Input board reads pressure from 0 to 1.5 psi. If there is a small air leak i.e. pin hole or tiny crack in the level tube this fault will occur. Please check all fittings associated with the level system from the pressure sensor down to the machine level fitting.

Overshooting programmed levels.

- This can be caused by a slow acting water valve letting in more water after it has been told to close by the LC102.
- This problem can also be caused by lag time. When the LC102 sees the programmed level has been reached it will turn off the water output relays which turn off the water solenoids which decrease the pressure in the air line so that the water valve will shut off. This lag time depending on the water pressure may inject a further 5 to 10 cm of water into the machine. This can be compensated for in the program, decreasing water pressure or using fast double acting water valves and solenoids.

Machine Overfilling while the level is accurate.

- Hot or Cold water valves maybe stuck open or unable to turn off.
- Hot or Cold Solenoid valves maybe not be operating correctly.
- LC102 Output relays may not be turning off. Contact Total Systems Control Ltd for replacement relay board.

Level on Display is different to level in Machine.

- A small blockage in the level hose could cause this to happen. Clear the level tube by disconnecting it at the LC102 end and blowing back down it into the machine. Please do not blow back into the LC102 pressure sensor, this could cause permanent damage.
- The level will need to be recalibrated using the potentiometers on the Input board. See section in this manual about Level recalibration.

Level Display keeps flashing 1 or 2 cm of water while trying to drain.

- A small blockage in the level hose could cause this to happen. Clear the level tube by disconnecting it at the LC102 end and blowing back down it into the machine. Please do not blow back into the LC102 pressure sensor, this could cause permanent damage.
- The level will need to be recalibrated using the potentiometers on the Input board. See section in this manual about Level recalibration.

TEMPERATURE FAULTS

Temperature on the display reads 0 or 1 or 99 degrees.

- Temperature probe is not plugged into the Input board properly.
- Temperature probe wires maybe in the wrong terminals, check wiring.
- The Temperature sensor found inside the metal housing has been damaged or shorted to the out side case. You will need to either repair it, obtain another one or make another one (see temperature probe repair instructions in this manual).

RELAY OUTPUT FAULTS

A specific relay output does not work.

- Check to see that the relay output light is operating when it should.

Yes : Then check that the voltage is being switched to the terminal that is associated with that output. Check also the (solenoid, contactor, relay etc.) connected to that output.

No : Contact Total Systems Control Ltd. You most probably have a faulty relay board.

All Relays are not operating, but the input lights are on.

- Is the RPwr (Relay Power) light on. This is found next to the speed sensor on the combo board.

Yes : Check all ribbon cable connections, otherwise you most probably have a faulty relay board. Please contact Total Systems Control Ltd for a replacement board.

No : Check the earth connections on the combo board, other wise you may have a faulty Combo board. Please contact Total Systems Control Ltd for a replacement board.

All Relays are not operating, No Inputs are on but the screen seems normal.

- The 24 VDC fuse has blown. The 24 VDC fuse is a resistor called R1, this is found on the Combo board. R1 should have a value of 10 ohms. Replace R1 with another 10 ohm flame proof resistor.

INPUT FAULTS

A specific Input is not operating correctly.

- Short out that input directly to the input common to see if the input light comes on.
 - Yes : Check the associated input switch (door switch, vibration switch etc.) for correct operation.
 - No : Try using a different input common otherwise you may have a faulty Input board. Please Contact Total Systems Control Ltd for a replacement board.

All Inputs seem dead, no lights are on, keyboard screen looks normal.

- Check the 24 VDC lead that comes up from the Combo board to see that it has 24 VDC on the end of the plug.
 - Yes : Make sure the plug is in the correct way, otherwise you may have a faulty Input card. Please Contact Total Systems Control Ltd for a replacement board.
 - No : The 24 VDC fuse has blown. The 24 VDC fuse is a resistor called R1, this is found on the Combo board. R1 should have a value of 10 ohms. Replace R1 with another 10 ohm flame proof resistor.

KEYBOARD FAULTS

Keyboard looks dead, no back light or characters on the screen.

- First check to see if the LC102 black box is operating i.e. if you see lights and indicators on inside.
 - Yes : The keyboard fuse has blown. There is a keyboard fuse located on the Combo board (see technical diagrams for details and location) that protects the keyboard. Replace this fuse with 650mA - 1 Amp fuse.
 - No : Check all control circuit breakers, fuses and switches to see that they are on. Check also the LC102 fuse which is located inside the LC102 Line filter.

Keyboard Keys are not responding when you press them.

- To test this you need to perform a keyboard response test. To do this you must turn off the LC102 then when you turn it back on again you must press the START and F1 keys together while the keyboard is running it's little test routine before the LC102 initialises. You will see a

grid on the screen, when you press a key it is reflected onto the screen to show that it has been read. Press all keys to see if they all respond correctly.

V25 CPU FAULTS

The Keyboard Screen keeps scrolling characters and not initialising.

- This problem indicates the LC102 has been upset by either a power spike, brown out, electrical noise or even vibration causing movement of components. The first course of action would be to pull the LC102 apart, back to the bottom two boards (V25 & Combo) and recheck all ribbon cable connections as well as checking all micro chips are all sitting tightly in their respective sockets. Power the LC102 back up again. If the LC102 doesn't work then contact Total Systems Control Ltd technical support.

There is a black flashing cursor in the top left hand corner. The LC102 seems to be frozen.

- This problem is related to the internal NOVRAM (this is the chip where all formulas, timers and machine configurations live). This fault suggests that it has been corrupted due to power spikes, brown outs, electrical noise and vibration. To remedy this you need to clear the NOVRAM and then reload the Cyber card back into it.

Clearing the NOVRAM and reset using Cyber card :

Turn the LC102 off.

Find the 8 way Dip switch on the V25 board.

Find dip switch #6 and flick it to ON.

Turn back on the LC102.

The screen should now say "Invalid Machine Type".

Turn off LC102.

Return dip switch #6 back to OFF.

Turn on LC102, go into Setup 1 General, select "New Machine type" select your machine.

Go into Setup 1 Operators, configure yourself as an operator and give yourself access to all parts of the LC102.

Go into Diagnostics and load in the Cyber card information for that machine.

The Keyboard screen Displays "Invalid Machine Type".

- This problem is related to the internal NOVRAM (this is the chip where all formulas, timers and machine configurations live). This fault suggests that it has been corrupted due to power spikes, brown outs, electrical noise and vibration. To remedy this you need to clear the NOVRAM and then reload the Cyber card back into it.

Clearing the NOVRAM and reset using Cyber card :

Turn the LC102 off.

Find the 8 way Dip switch on the V25 board.

Find dip switch #6 and flick it to ON.

Turn back on the LC102.

The screen should now say "Invalid Machine Type".

Turn off LC102.

Return dip switch #6 back to OFF.

Turn on LC102, go into Setup 1 General, select "New Machine type" select your machine.

Go into Setup 1 Operators, configure yourself as an operator and give yourself access to all parts of the LC102.

Go into Diagnostics and load in the Cyber card information for that machine.

