Engineering Note

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Title:	Extra facilities in Hydro-Control IV version 2.40
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Summary:	This document details some new facilities which have been added to the Hydro-Control IV in revision 2.40 of the operator terminal firmware and should be read in conjunction with the user guide.

Real time clock

All operator terminals incorporate circuitry to maintain a real time clock, but until this issue of firmware the system could not take advantage of this.

The real time clock values are now incorporated into batch printouts and mix-log records.

The time and date are set by a new option in the main menu, titled **Time/date set-up**. The use of this should be obvious when selected.

Hand mode Reset Sequence option

Following numerous requests for such a facility, this now offers the opportunity to force a 'mix complete OK' signal to be issued on re-entry to automatic mode. To use this from hand mode….

Select **Reset Sequence** key and accept; a new **Mix complete?** pop-up will appear.

Accepting this pop-up will cause the Mix complete/OK signal to be output to the control system when Auto Mode is next entered. If this pop-up is rejected, then the cycle will be reset without issuing the mix complete as in earlier versions.

Backup/Restore facilities

Following several requests, we have added a facility to backup and restore all the information in the operator terminal including recipes and all configuration data. This has been done to assist commissioning engineers who require a quick method of restoring a terminal to a default configuration which may be different from our factory defaults.

The backup/restore is implemented via the RS232 port and needs a cross-over (null modem) cable between the port on the back of the operator terminal and a standard PC.

The backup/restore utilities are designed for MS-DOS use and so will work with most PCs used in the field.

These utilities are available on floppy disk from Hydronix.

Saving the contents of an operator terminal

Before using the backup utility, the operator terminal must be placed in the backup/restore mode which is selected from the main menu using a pass-code of 31415. Note that when this mode is selected, the system is effectively taken off-line and cannot be used to control the mixing cycle. Once backup/restore operations have been completed, you must power cycle the unit to restore normal operation.

The command syntax is…

backup <directory> <port>

where <directory> is the name of a directory on the PC disk where the operator terminal files are to be saved and <port> is the COM port number you are using on the PC.

The utility creates a series of files representing the different data structures in the operator terminal.

Restoring the contents of an operator terminal

Before using the restore utility, the operator terminal must be placed in the backup/restore mode which is selected from the main menu using a pass-code of 31415. Note that when this mode is selected, the system is effectively taken off-line and cannot be used to control the mixing cycle. Once backup/restore operations have been completed, you must power cycle the unit to restore normal operation.

The command syntax is…

restore <directory> <port>

where <directory> is the name of a directory on the PC disk where the operator terminal files are to be loaded from and <port> is the COM port number you are using on the PC.

Capturing mix-log data

The current contents of the mix log can now be captured to a PC using the **mixlog** utility. This may be used at any time and does not require the Hydro-Control to be taken off-line; however, it does require the RS232 port use to be set to Remote Link.

The command syntax is…

mixlog <filename> <port>

where <filename> is the name of the file on the PC disk where the data is to be saved and <port> is the COM port number you are using on the PC.

The data is saved in a comma-separated-variable format which can be imported by most popular spreadsheet programs.

RS232 command set

This version incorporates a number of new features available via the RS232 link. These are in addition to the existing RS232 commands and may be used in conjunction with them.

These additional commands allow the Hydro-Control to be much more tightly integrated into a system than hitherto possible.

Recipe parameter read/write

Recipe parameters can be changed by specifying the recipe number (1-200), the parameter number (1-23, see table below) and an integer value (-9999 to 9999, see table below for units). See later for return values.

The write command format is:

 # R recipe parameter value <cr>

The read command format is:

 # R recipe parameter <cr>

Parameter	Description	Units
1	Dry weight of aggregates (Kg)	1
2	Weight of cement in mix (Kg)	1
3	Pre wet water (L)	0.1
4	Pre wet mixing time (s)	1
5	Cement call enable (0=off, 1=on)	1

6	Preset water in (L)	0.1
7	Automatic water (%)	0.1
8	Water trim in (L)	0.1
9	Max limit for auto water (%)	0.1
10	Dry mix time (s)	1
11	Admix 1 call enabled (0=off, 1=on)	1
12	Admix 2 call enabled (0=off, 1=on)	1
13	Wet mix time (s)	1
14	Positive tolerance limit (%)	0.1
15	Negative tolerance limit (%)	0.1
16	Batch count	1
17	x1 Sensor scaling value - dry mix (%)	0.01
18	y1 Sensor scaling value - dry mix (%)	0.01
19	x2 Sensor scaling value - wet mix (%)	0.01
20	y2 Sensor scaling value - wet mix (%)	0.01
21	x3 Sensor scaling value - wet mix + additive (%)	0.01
22	y3 Sensor scaling value - wet mix + additive (%)	0.01
23	Auto enable flag. (0 = pre-set mode only, 1 = auto or pre-set mode allowed). Essentially, this means that the calibration data stored in parameters 17 through 22 is valid.	1

Read mix log record

The mix log can be read by specifying the record number (1-100) and the parameter number (1-32, see table below). See later for return values.

Command format is:

`# M record parameter <cr>`

Parameter	Description	Units
1	Day	1
2	Month	1
3	Year	1
4	Hour	1
5	Minute	1
6	Recipe number used	1
7	Batch count number	1
8	Water method used (1=preset, 2=auto)	1
9	Operator trim level used (L)	0.1
10	Dry weight of aggs used (Kg)	1
11	Water target (L)	0.1
12	Water added during control phase (L)	0.1
13	Water added during control phase excluding any admix rinse (L)	0.1
14	Second water added in two-shot mode (L)	0.1

15	Water added in error during control phase (L)	0.1
16	Water added in hand mode during control phase (L)	0.1
17	Water to cement ratio	0.01
18	Auto target in recipe (%)	0.1
19	Dry moisture (%)	0.01
20	Final moisture (%)	0.01
21	Dry mixing time (s)	1
22	Wet mixing time (s)	1
23	2nd wet mixing time (s)	1
24	Total mixing time (s)	1
25	Alarm flags 1 during mix	1
26	Alarm flags 2 during mix	1
27	x1,LNow value at end of dry-mix	0.01
28	x2,LNow value at end of wet-mix - water only	0.01
29	x3,LNow value at end of wet-mix with admix	0.01
30	dm12,Change in moisture content from main water (%)	0.01
31	dm13,Change in moisture content from total water (%)	0.01
32	Valid mix record flag (0=invalid, 1=valid). This means that the data contained in this record can be used for calibration purposes i.e. the mix sequence completed normally and the unscaled inputs (Lnow) were from stable readings.	1

To find the number of records in the mix log use the read mix log command with no parameters.

Global water addition mode

The Write command format is:

`# W value <cr>`

Value	Mode
1	preset
2	auto

To read the current mode use the command with no parameters.

See later for return values.

Reset all recipes to pre-set mode

Command format is:

`# P <cr>`

See later for return values.

Return values

The HC4 replies to all commands, all possible replies are listed in the table below.

Value	Meaning
-9999 to 9999	Parameter value as an integer, or 0 to indicate successful completion of a

	command
?10	Invalid command
?11	Parameter 1 out of range
?12	Parameter 2 out of range
?13	Parameter 3 out of range