

Title:	Hydro-Control Junior to Hydro-Control V software upgrade procedure
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Products affected:	Hydro-Control Junior
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Summary:	How to prepare and use the software upgrade "Programming Adapter" PCB.

INTRODUCTION

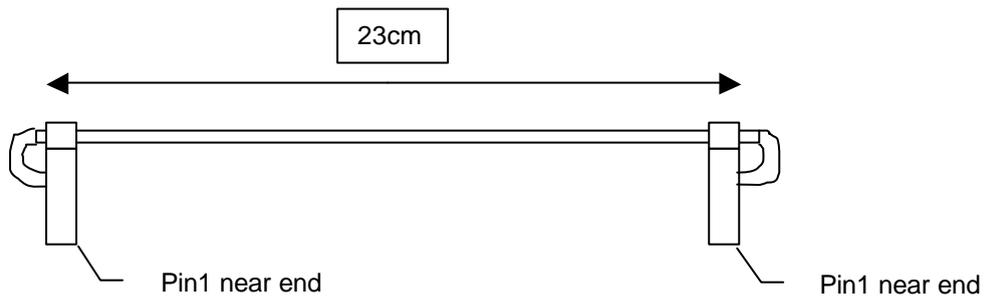
The Hydro-Control Junior has been superceded by the Hydro-Control V. Both these products use the SAME hardware, box, pcb, IC's etc. The Hydro-Control V has the capacity for more programs, has more methods of controlling the water and also operates in a different way than the Hydro-Control Junior. There are, however, similarities between the two and these should be investigated BEFORE an upgrade is undertaken. It should be assumed that any data stored in the Hydro-Control Junior, i.e. default values, user recipes etc. WILL be destroyed during the upgrade. The communication commands that the junior supports are ALL repeated in the Hydro-Control V so connections to third party Batch Control Systems should not be affected. The way in which the water is controlled, with regards Batch Control System sequencing, may well need to be checked and changed to take advantage of the Hydro-Control V's advanced features. These feature changes are not relevant to this Engineering Note and should be identified by comparing the handbooks of the Hydro-Control Junior and V.

The information contained in this Engineering Note may well be more advanced than that required by the site engineer, so two sections have been written, the first - HYDRONIX PREPARATION PROCEDURE for Hydronix engineering staff to use to prepare the upgrade adapter with the current software version and the second - USER UPGRADE PROCEDURE for the site engineer to use to install the upgrade.

HYDRONIX PREPARATION PROCEDURE

- Identify the latest general released Hydro-Control Junior upgrade issue of Hydro-Control V software from directory:-
G:\Products\Hydro-Control V\Software\HS0035 Issue X\FLASH_ST.BIN
Note FLASH_ST.BIN is a combination of HS0042 (reprogramming program) and HS0035 (application flash memory image) and uses the DOS program HS0041 to do the combination. This is done automatically when a new Hydro-Control V version is released.
- Obtain a new unprogrammed EPROM – M27C4002-12F1 or equivalent.
- Programme FLASH_ST.BIN into the EPROM and label as HS0035 V X + ST (use ST for AMD IC's) or INTEL for destination FLASH manufacturer. Note there were very few INTEL types ever used (10 off) and any left should be with Hydronix Personnel only as they were only intended for demonstration units as indicated by the word DEMO attached to the serial number.
- Obtain a Programming Adapter Board (PAB) HD0162 V 1.20.
- Insert the labelled programmed EPROM into the socket.

- Make up a 40 way ribbon cable assembly as:-



- Attach the ribbon cable to the PAB ensuring that the cable does not cross the board.

EXPLANATION OF UPGRADE

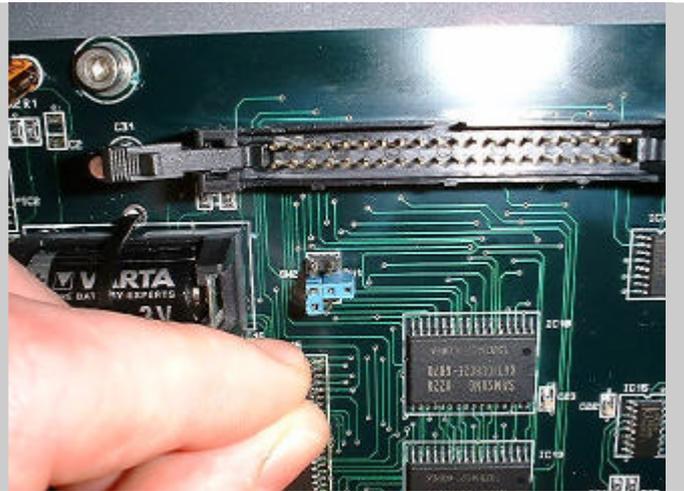
The Junior has its application software stored in FLASH memory which is programmed using the PAB after being soldered into the board using surface mount technology (i.e. cannot be removed/replaced on site). In order to reprogram with a software upgrade, the processor has to start from power up using instructions from another source. This other source is the Programming Adapter Board (or emulator board) which is plugged into the Hydro-Control's main circuit board via the multipin connector labelled CONN1. In order to force the processor to look at this connector for its upgrade program to run, the links must be set correctly as below. On power up, the processor runs a small upgrade service program located in the PAB EPROM and this service program copies the new Hydro-Control V application program, stored in the same PAB EPROM, into the FLASH memory on the Hydro-Control Junior main board, overwriting the old Hydro-Control Junior application program as it goes.

USER UPGRADE PROCEDURE

After removing the back metal case of the Hydro-Control housing, carry out the following procedure.

1. Put the left hand jumper (SW2) onto the bottom two pins. The position of the other jumper is dependent on the type of FLASH fitted: for ST or AMD types, jumpers SW1 must be left open (no jumper) and for Intel type SW1 must connect pins 2 and 3 (bottom two pins).

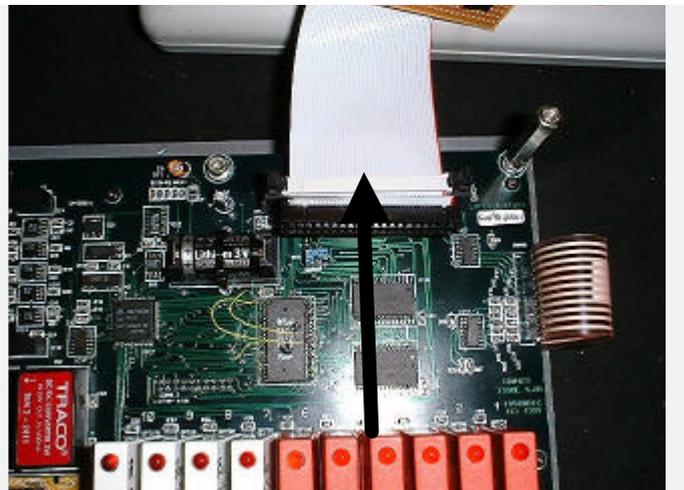
The ST or AMD type, labelled as ST for both on the EPROM label is shown on the PAB after the version number and should match the manufacturer of the FLASH chip on the main board as ST or AMD.



2. Connect the EPROM Programming Adapter Board to CONN1 by attaching so the cable CROSSES the board from the BOTTOM. Press down firmly.

NOTE: IN THIS PICTURE THE CABLE IS COMING FROM THE TOP INSTEAD OF THE BOTTOM AS THE CABLE HAS NOT BEEN BENT OVER AND CLAMPED UNDER THE CABLE CLAMP as the one sent.

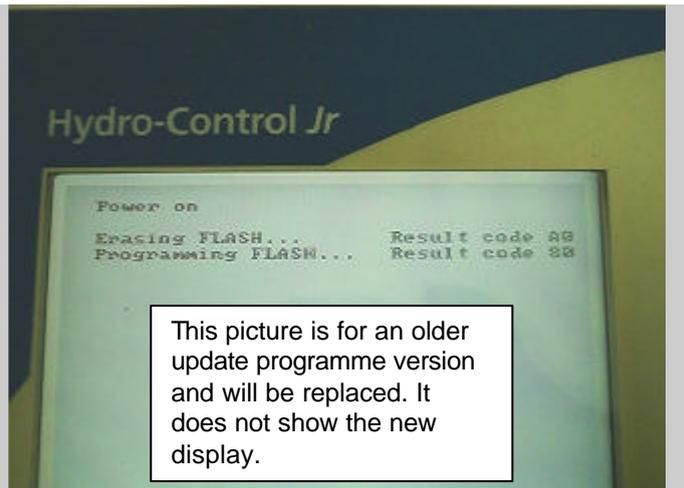
Pin 1 is marked by a small triangle on the outer end edge of the cable connector and also marked on the HC Jnr PCB in white lettering.



3. Apply power to the Hydro-Control Junior

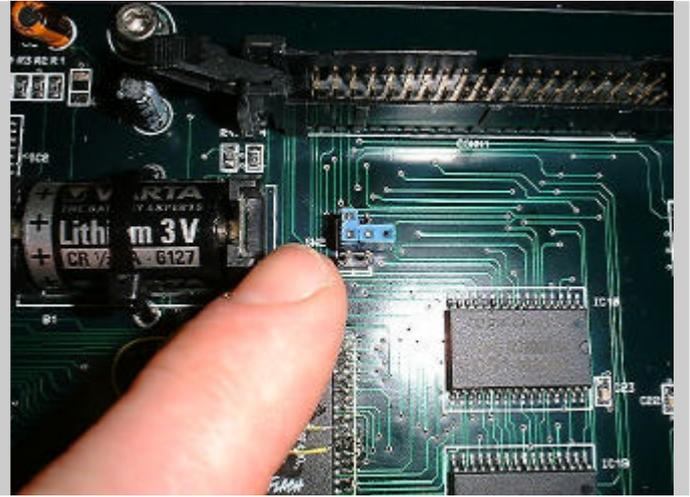
4. Wait for ~10 seconds. As soon as the display shows the two Result codes of 001 then the programming is complete.
Erasing Flash.... Result Code 0001
Programming Flash.... Result Code 0001
which indicates that the program has been loaded satisfactorily.

The continuously updating field displays on the lines below should be ignored, as these are for Hydronix Engineering use ONLY and are showing a data dump after programming is complete.



5. Disconnect the Hydro-Control Junior from the power and then disconnect the PAB cable from CONN1.

6. Return the jumper on SW2 to the upper two pins. Check the position of the other jumper as per Section 1 above.

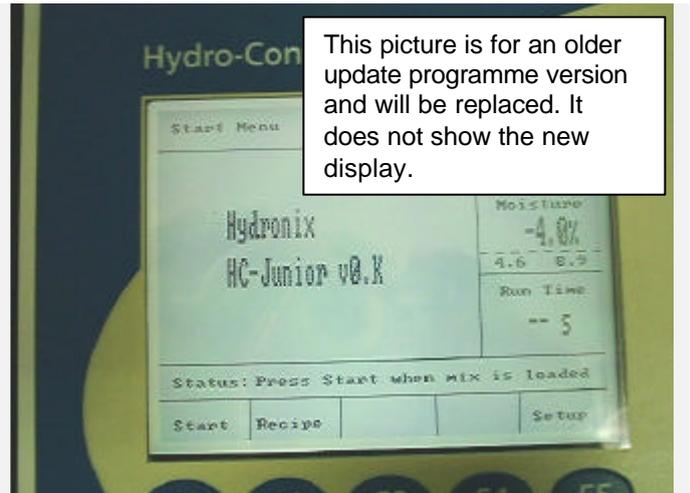


7. Reapply power to the, now Hydro-Control V. The Display should show the start-up screen including the software version number.

NOTE: THIS PICTURE SHOWS "HC-JUNIOR" YOUR UPGRADE WILL SHOW "HYDROCONTROL V"

Programming is now complete.

Note: the Hydro-Control V will NOT start with the links returned to the lower position AND with the upgrade board STILL installed!



When the PAB has been used, please return it to Hydronix Limited in then UK as it is a loan only item.

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