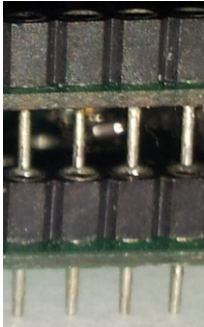
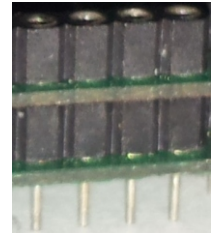


Hx7 pinStack

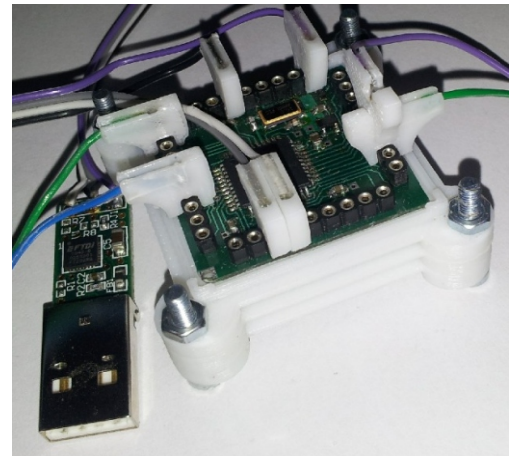
Hx7 pinStack is a framework for very compact circuit board stacking, quick prototyping, powerful parallel processing and easy access to micro controller I/O system.



Printed circuit boards are clamped together from the picture on the left to the picture on the right. Number of boards can be stacked indefinitely in this manner to form a powerful system.

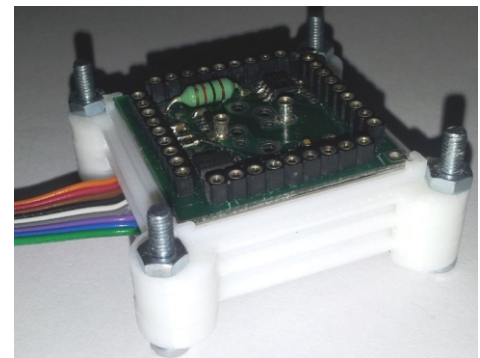
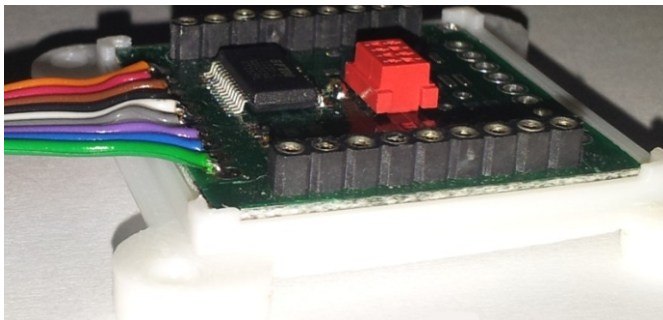


On the right, three framed hx7 boards are piggybacked on a shared internal bus. The stack may contain number of processors from different manufacturers communicating and sharing the pins. Six pins are reserved for power delivery, the remaining 30 pins are free to be defined by the board designer.



The user can connect to a pin of choice using single pin clips, that snap in place (see image on the right). Pin clips can piggyback on each other just like the boards.

Below (left), a ribbon cable is directly soldered to free pins on a board and made available between the stacked frames as shown in the image on the right. The PC boards snap the frames together so bolting the frames may not be necessary, but it provides strength.

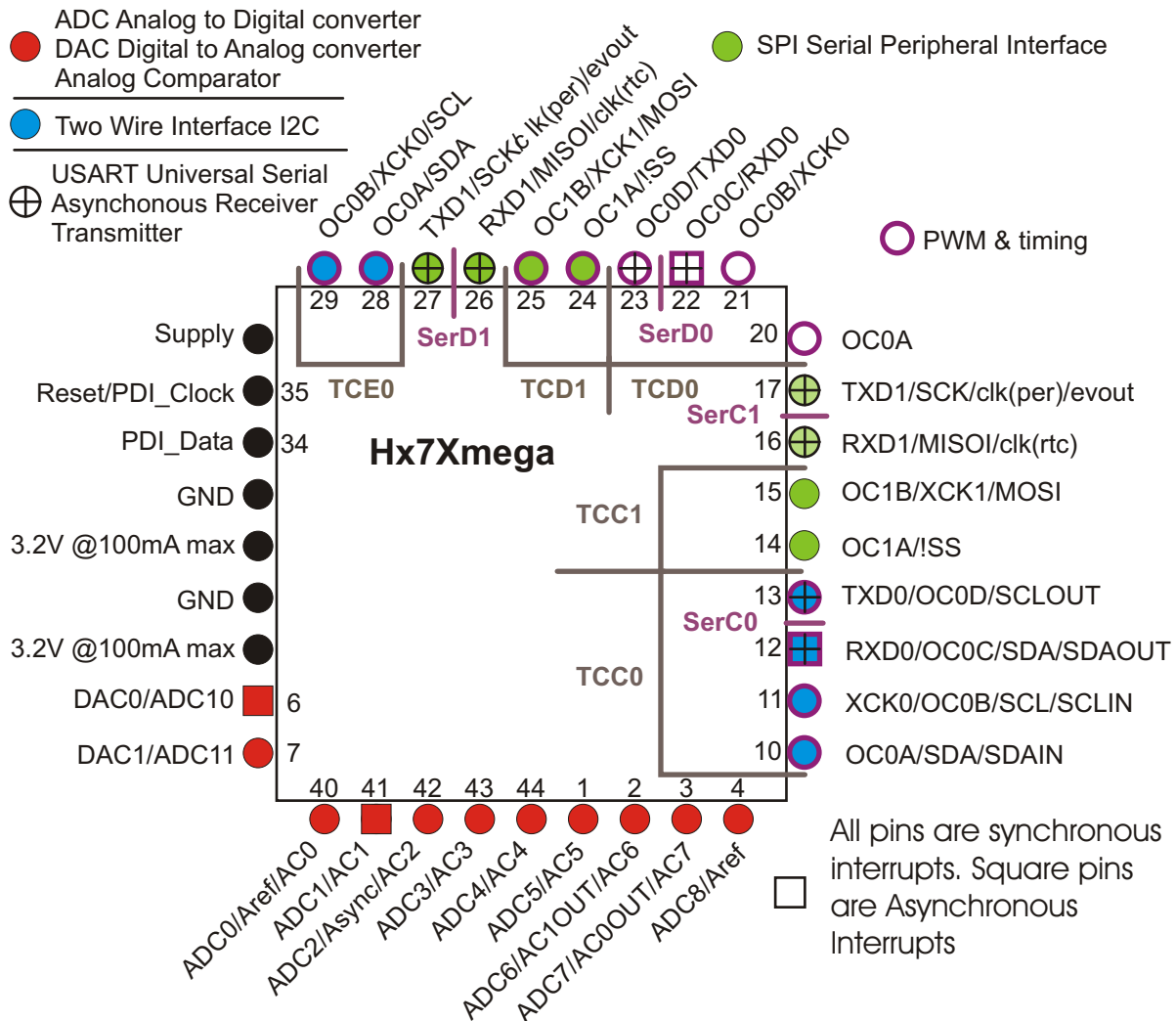


Hx7 Xmega processor Module

Many Xmega modules can operate on the same pin stack where each has a unique ID. Code, is uploaded into a selected module through a single pin without interrupting other processors on the stack. Xmega modules will only store code with a proper address on flash memory. On next startup this code will be executed from the Xmega application section. For easy flash read and write, the user has access to specialized functions stored in the Xmega boot section.



Hx7 I/O map: Pin numbers correspond to the Atxmega 128A48, 64A4U/ 32A4U and 16A4U for further information go to atmel.com and view the datasheet for these micro controllers.

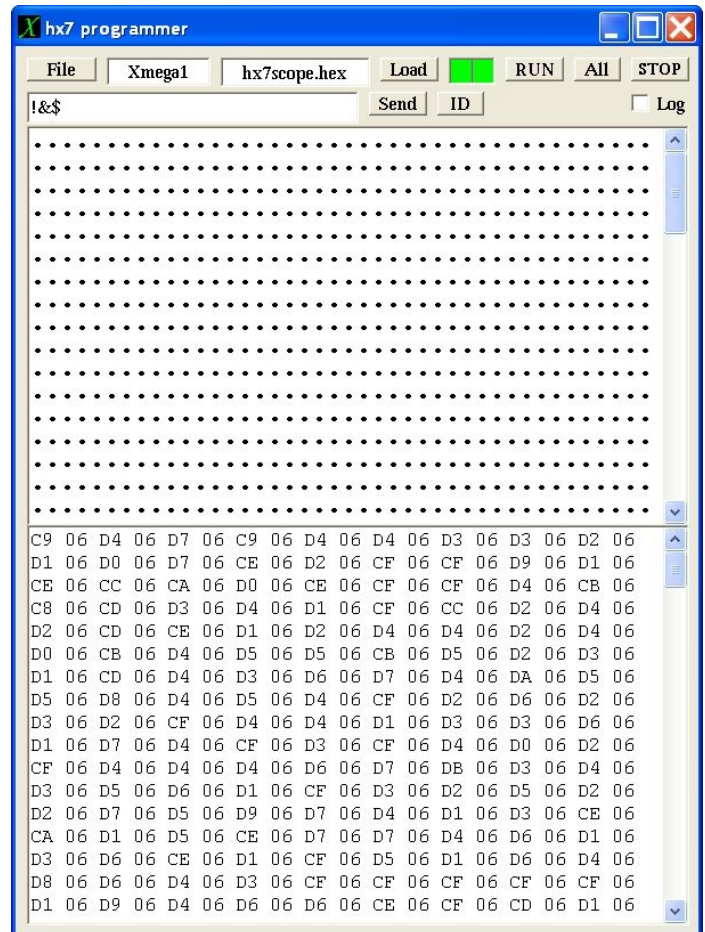


The hx7 programmer

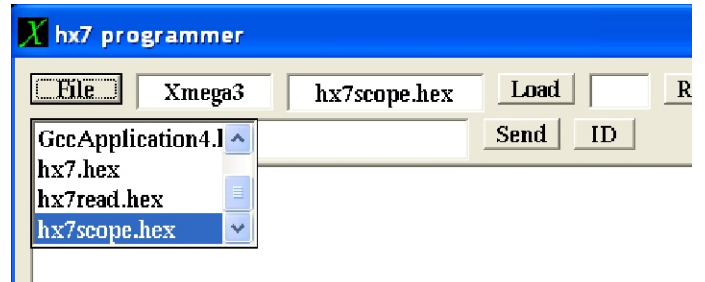
Click the [load] button and the programmer will upload intel standard hex file through a single selected pin on the pin array to the device specified in ID window, that is [Xmega1]. Hex files contain the executable machine code generated by compilers and assemblers. Click the run button and Xmega1 will execute the uploaded program. To run all the devices on the stack simultaneously click [All]. The [stop] button will stop all running devices.

Lower row command window, lets the user write commands and send to the specified device. Click the ID button to get the ID of the program running on the specified hx7Xmega board.

The bottom window pane shows hexadecimal data stream on a selected pin, in this case it is coming from the hx7oScope program. Binary stream is shown in the upper window pane, dots represent unprintable characters.



On the right the program hx7scope is selected for uploading into Xmega3.



The green window on the right indicates that 132 pages of program code has been uploaded to Xmega3, and verification received. If the window is red then an error occurred.



A white window showing 132, indicates that 132 pages have been uploaded. But no verification of receipt has been received. In some cases when code is being broadcast over long distances or to many devices simultaneously, we may not have the luxury of receipt and must proceed open ended. The hx7 will not execute the code if it happens to be scrambled.

Hx7 Identities

Hx7 devices have identities that go from the least to the most specific left to right respectively. Valid hx7 command syntax is:

Xmega1&id

Xmega1 will respond to this command with own identity followed by #. The hash symbol stands for acknowledge. Also valid is:

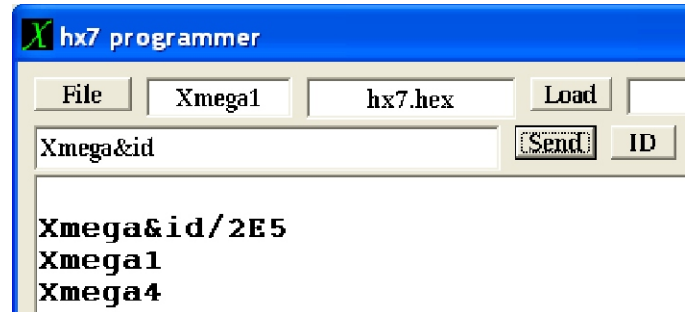
Xmega4&id

Here Xmega1 will not respond but Xmega4 if on the stack, will respond with own identity and #. The following sequences are also valid:

Xmega&id
Xmeg&id
Xme&id
Xm&id
X&id

Both Xmega1 and Xmega4 will respond to the queries above like shown on the right with their own names, but no #. Acknowledge is only issued when the address is spot on.

Both Xmega1 and Xmega4 used the same pin to emit their response. Both devices wait for a specific time period based on own last digits that seal their identity. Then they check if the line is clear and if so they emit their response. The same process takes place when two devices are streaming data on the same pin, one waits until the other is finished. If no other devices are streaming on the pin there is minimal delay.



Programs running on devices also identify themselves in this manner.

The ID button on the right side on the image is a call for identification. Exclamations symbol means all devices. The command. !&id will force all devices on stack to emit their identity, one after another.

This addressing scheme applies to all commands on the hx7. For example:

Xmega& fr 1C < 2A

All Xmega identities copy own RAM page 2A into FLASH page 1C

X& gr 1000 20

Identities starting with the letter X emit 32 (20 hex) bytes from Ram location 1000 (hex)

Xmega4& gf 4FC0 A0

Here only Xmega4 will emit A0 (160) bytes from hex memory 4FC0

Any device with access to the serial pin can request and manipulate information in this manner.

Note: hx7 devices ignore spaces to the right of the ampersand or &

The evaluation kit contains

- Hx7 programmer (windows)
- Hx7 wifi access point
- Hx7 Xmega (user programmable)
- Hx7 oscilloscope on a chip (Xmega user programmable)
- Hx7 oscilloscope viewer for windows
- Hx7 sample programs
- Hx7 Circuit schematics and Hx7 dimensional specs.
- Pin clips 10 pieces piggyback stackable
- Bus Pins 4 rows spare
- Guide to C and assembler pin stack programming
- Access to the Hx7 forum
- Free upgrades
- The right to create and distribute your own Hx7 products royalty free.

Price 158 euros.