**Intel Hex file formats**

Intel hex file is the standard file format which used for programmer to emulate how the data is stored in the flash or ROM or EEPROM etc.

: Start of record

ll Record length

aaaa address

tt HEX record type

**00** - data record  
**01** - end-of-file record  
**02** - extended segment address record  
**04** - extended linear address record  
**05** - start linear address record (MDK-ARM only)

dd data-field that represents one byte of data

cc Checksum

**Checksum procedure:**

01H + **NOT**(sum of all dd)

Extended Linear Address Records

When an extended linear address record is read, the extended linear address stored in the data field is saved and is applied to subsequent records read from the Intel HEX file. The linear address remains effective until changed by another extended address record.



Start Linear Address Records (MDK-ARM only)

Start linear address records specify the start address of the application. These records contain the full linear 32-bit address. The start linear address record always has four data bytes. The Start Linear Address specifies the address of the \_\_main (pre-main) function but not the address of the startup code which usually calls \_\_main after calling SystemInit().

:0400000508008199D5  
Address: 000016 = 010  
Byte count: 0416 = 410  
Record type: 0516 = Start Linear Address  
Checksum: D516  
Calculated checksum: D516

**Examples**



Address: 801016 = 3278410  
Byte count: 1016 = 1610  
Record type: 0016 = Data  
Checksum: 8516  
Calculated checksum: 8516

**Starting address of flash**

Every hex file starts with base memory address from where it has to start writing to flash. Here this is the line we got from the hex file of user application while generating hex file. This is also verified with STM32 ST-Link tool.

:020000040800F2  
Address: 000016 = 010  
Byte count: 0216 = 210  
Record type: 0416 = Extended Linear Address  
Checksum: F216  
Calculated checksum: F216

**Writing hex file data into the flash**

:108C400037FAE8B90DE000F033FAC8B9288821688E  
Address: 8C4016 = 3590410  
Byte count: 1016 = 1610  
Record type: 0016 = Data which will be used to put into the flash  
Checksum: 8E16  
Calculated checksum: 8E16

**End of File**

:00000001FF  
Address: 000016 = 010  
Byte count: 0016 = 010  
Record type: 0116 = End Of File  
Checksum: FF16  
Calculated checksum: FF16