GRADE A

MESC TECHNICAL NEWS No.M16C-37-9910

M16C/80 Group

Cautions for Use INT Instruction

1. Affected devices

- M30800MC-XXXFP/GP
- M30800FCFP/GP
- M30803FGFP/GP
- M30802MC-XXXGP
- M30802FCGP
- M30805FGGP
- M30802SGP
- M30800MCT-XXXFP
- M30800FCTFP

2. Detail

When issue software interrupt by INT instruction, interrupt level (IPL) of flag register will be unknown value during interrupt routine. When finish interrupt routine, IPL replace to normally level. Interrupt that IPL will be unknown is only INT instruction interrupt.

3. Countermeasure

If don't enable interrupt (Set I (1)) in interrupt routine, it is no problem.
(Because IPL will be normally value when finish the interrupt routine.)
If you enable the other interrupt, you need a following countermeasure.

(Ex.1) If you know IPL value when execute the INT instruction, please set that value using the 'LDIPL' instruction.
(Ex.2) If you don't know IPL value, please read the IPL value from stack memory and set to IPL.

Also, if you enable interrupt while occur Non Maskable interrupts in interrupt routine of 'INT' instruction, you must set IPL in interrupt routine of INT instruction again.
Non maskable interrupt which require to set the IPL :
'Address match', 'BRK instruction', Overflow, Undefined instruction
(IPL of NMI and Watchdogtimer are set to 7 automatically, so no problem)

If you are using Realtime OS MR308, you will be taken care of with next version.
If you want to know MR308 in detail, please see 'Precaution for MR308 V.1.00 Release 1' (MESCT-MR308-991001D)

Ex.1) Case where IPL is known when executing INT instruction, (Example of execute 'INT' instruction with always IPL=2)

```
main:
  ••••
  int       #63          ;INT instruction interrupt
  ••••
int_63:                  ;INT instruction interrupt routine
  ldipl     #2           ;Set ipl
  pushm     •••          ;Stack register
  ••••
```

Ex.2) Case where IPL is not known when executing INT instruction.

```
main:
  ••••
  int       #63          ;INT instruction interrupt
  ••••
int_63:                  ;INT instruction interrupt
  pushm     r0
  stc       flg,r0
  mov.b     7[ sp] ,r0H
  and.b     70H,r0H
  ldc       r0,flg       ;Set FLG
  ••••
```