INSTALLATION INSTRUCTIONS
FOR FANUC 16i / 18i / 20i & 21i Controls

SAVE CNC DATA WITH PCMCIA SRAM CARD BEFORE UPGRADING MEMORY

All Fanuc Series iA controls have a memory card slot on the front left-hand side of the LCD.
This slot is to be used with an PCMCIA SRAM card to back up all of your existing SRAM memory module.
Using a PCMCIA SRAM card, you will be able to quickly and easily perform a complete backup for safety
reasons. Although the procedure can be done manually with the serial port, we strongly recommend you use
this SRAM card feature during this memory upgrade.

There are various sizes of SRAM cards that can be purchased – 0.5, 1, 2 & 4 megabytes.

- When you have a Fanuc iA control that is upgraded to 2 megabytes of memory, a 4 megabyte
  SRAM card is very convenient for back up and restore.

- The Fanuc 20 & 21 iA controls have a maximum memory of 512 kilobyte (1280 meters) and so
  a 1 megabyte SRAM card is very convenient to back it up.

1. DIRECTIONS TO USE SRAM CARD FOR A SYSTEM BACK-UP

Turn the control ON while pressing the two right-hand soft keys until the System Monitor Main Menu Screen comes up.

Select number 5 (SRAM DATA BACK-UP).

Press SELECT soft key.

Choose number 1 (SRAM DATA BACK-UP TO CNC MEMORY CARD).

Press SELECT.

Press YES.

The screen will now show COMPLETE.

Press SELECT. Now exit by paging down to END. Press SELECT. Page down to 10:END. Press SELECT and YES.

You will have a binary file (or files) on your PCMCIA SRAM card with all the data of your control. At this time using a computer with a PCMCIA Type II slot, save the files immediately and make an additional backup as well.
This table shows the file names for the different SRAM modules that the control can use.

Module   file names(s)

256k   SRAM256A.FDB
512k   SRAM0_5A.FDB
1.0 Meg SRAM1_0A.FDB SRAM1_0B.FDB
2.0 Meg SRAM2_0A.FDB SRAM2_0B.FDB SRAM2_0C.FDB SRAM2_0D.FDB
3.0 Meg SRAM3_0A.FDB SRAM3_0B.FDB SRAM3_0C.FDB SRAM3_0D.FDB SRAM3_0E.FDB SRAM3_0F.FDB

2. BACKUP OF PART PROGRAMS IS NECESSARY.

After booting to the normal Fanuc screen, you must now download to this same PCMCIA SRAM card (or to a PC using the standard Fanuc serial port) the following information:

► BACKUP ALL YOUR PART PROGRAMS & O8000/O9000 MACRO PROGRAMS as they likely will be lost when the new option is enabled to expand the memory.

It is recommended that you also backup all NC PARAMETERS, PMC PARAMETERS, PITCH ERROR COMPENSATION, MACRO VARIABLES, OFFSETS and any other variables to have a readable copy of the system parameters before this upgrade.

How to do this is discussed in your Maintenance Manual under "Inputting and Outputting of data".

3. <u>OPTIONAL FANUC BACKUP PROCEDURE USING THE SRAM CARD.</u>

Turn on the machine tool (the control is already on), home all axes, and clear any alarms.

3.1 Punching out NC parameters:

To select the M-Card as the I/O device (or leave the serial settings if you are downloading serially).
      To set the M-Card as the I/O Device, select MDI;
      Press OFFSET SETTING key;
      Press SETTING soft key;
      Turn on PWE (by setting PARAMETER WRITE ENABLE to a 1);
      Cursor down to I/O CHANNEL;
      Press 4 and INPUT (this selects the M-Card).

► TO UNPROTECT 8000 AND 9000 SERIES MACRO PART PROGRAMS
   With PWE on, now is a good time to unprotect the 8000/9000 Macro Programs. To do this go to Parameter 3202 and change bit 4 and bit 0 to a 0

   (e.g. P3202="xxx0 xxx0" where x is existing value).

Reset PWE to 0.
Select EDIT mode.
Press SYSTEM key.

If you are using a PC, make it ready to receive your NC Parameter file (e.g. Fanuc18i.NCP)
Press the following soft keys:
      PARAM, OPRT, "+", PUNCH, NON-0, EXEC

Now you will see OUTPUT flashing.
This procedure generates a file on the M-Card called "CNCPARAM.DAT".

3.2   Punching out PMC parameters:
Select MDI mode.

Press OFFSET SETTING key TWICE.

Make PWE = 1

Press the SYSTEM key.

Now press the following soft keys:
      PMC, then PMCPRM, then KEEP RL

Select K-17 and set bit one to one. (K17=xxxx xx1x)
      (Note if you have more than 20 Keep Relays, page down & change 900.1 to a 1 instead
      of K17.1=1. Also make sure you stop the ladder when reloading PMC parameters)

Change to EDIT mode.

Press left arrow key.
Press I/O soft key.

This brings up the Device Screen. Set it as follows:

DEVICE - M-CARD
FUNCTION - WRITE

Cursor down to the DATA KIND, and press PARAM, press EXEC..

Change to MDI mode.

Press OFFSET SETTING key and set PWE to zero.

Press RESET to clear PWE alarm.

3.3 Downloading Programs:

Go to EDIT mode.

Turn MEMORY PROTECT key OFF and ON.

Press PROG key.

Press "+", CARD, OPTR, PUNCH soft keys.
This will bring up the M-Card Directory.
You must now name the files you want saved as one file.

Call them, for example: "33" - Key in 33 and press the soft key F NAME.

Next type in -9999 [minus 9999], then press O SET, and then EXEC.

Your programs are now stored on the M-Card as FILE: NAMED 33.

3.4 To Save Offsets:

Press OFFSET SETTING key.

Press the following soft keys:
    OFFSET, OPRT, "+", PUNCH, EXEC

3.5 To Save Macro Variables:

Press OFFSET SETTING key.

Press the following soft keys:
    "+", Marco, OPRT, "+", PUNCH, EXEC
Now your backup is complete.

A Fanuc 18i Model A Control From Behind The Monitor

4. <u>PHYSICAL INSTALLATION OF THE MEMORY MODULE</u>

Have control and main machine power OFF.

Locate the buried Fanuc Memory Module (DIMM).
(Depending upon which hardware configuration you have, this may involve removing a yellow cage behind the display. If this is the case, disconnect the back light inverter connector at the upper right, the fans and the battery and any other cable in the way. Mark each cable and take care.)

Remove the mounting screws from each corner of the cage.
Pull the cage assembly straight back to disconnect it from the circuit board.
(Set it aside for later reassembly)
Remove any cards, which may be concealing the memory Fanuc Memory Module.
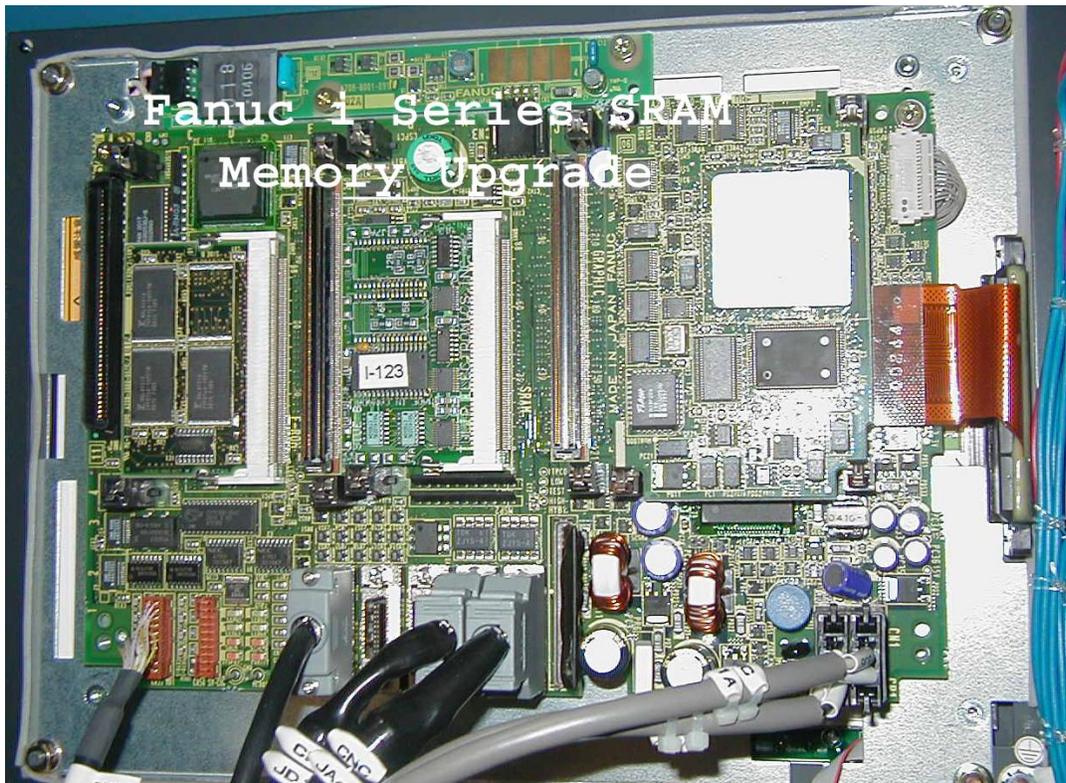
The memory can be recognized by one of the following numbers printed on the upper side, along the edge farthest from the socket into which it is fitted:

FANUC #	size
A20B-3900-0052	512k
A20B-3900-0053	256k
A20B-3900-0060	2Meg
A20B-3900-0061	1Meg

Remove the Fanuc Memory Module (DIMM) carefully with two hands – watch for static by grounding yourself before touch the boards.

Replace it with the TULIP Memory Module, which is mounted with B side UP (label showing).
Replace the card or cards that were removed to gain access to the DIMM.

Be very careful lining them up before pressing them into their connectors, as shown on Page B, attached.

Re-install the card cage, fans, etc, which were removed earlier.

Check that everything is correct.

You are now ready to power ON and complete the installation.

5. <u>LOADING DATA INTO YOUR CONTROL FROM THE PCMCIA SRAM CARD</u>

Enable E-STOP (Emergency Stop)

While pressing and holding **RESET** and **DELETE** to clear the new memory card, turn the control ON until the normal screen comes up (with alarms).

With the SRAM Card installed, turn the CNC off and then on holding the right 2 soft keys to get back to the BOOT screen.

Easy way:
Cursor down to #5 SRAM DATA
Press "SELECT"
With #1 SRAM DATA SAVE highlighted, press SELECT
Press "Y"
Remove the PCMCIA SRAM card and insert the it into your computer.

Create a new folder.
There are now 4 possible ways to proceed, depending on the original installed memory module:

        Module   file names(s)

Case 1: 256k   SRAM256A.FDB
Case 2: 512k   SRAM0_5A.FDB
Case 3: 1.0 Meg   SRAM1_0A.FDB   SRAM1_0B.FDB
Case 4: 2.0 Meg   SRAM2_0A.FDB   SRAM2_0B.FDB   SRAM2_0C.FDB   SRAM2_0D.FDB
Create a new folder.

Case 1: Open the SRAM256A.FDB file in plain text editor, copy the entire text.

        Open the SRAM3_0A.FDB file, highlight the first half and paste the copied text. Save the
        SRAM3_0A.FDB file to the PCMCIA SRAM card.

        Note: It is important that this saved file is the same size. If you are not comfortable doing this,
        send the SRAM256A.FDB file as an email attachment to us (cnc@tulipmemory.com) and we
        can do this for you. You can continue operating the machine until you receive the new file.
        Go to section 5.1 once you have the new file.

Case 2: Copy the SRAM0_5A.FDB file from the PCMCIA SRAM card to the new folder and rename it
        to SRAM3_0A.FDB on the PCMCIA SRAM card. **Go to section 5.1**

Case 3: Copy the SRAM1_0A.FDB and SRAM1_0B.FDB files from the PCMCIA SRAM card to the
        new folder and rename them SRAM3_0A.FDB and SRAM3_0B.FDB respectively on the
        PCMCIA SRAM card. **Go to section 5.1**

Case 4: Copy the SRAM3_0A.FDB, SRAM3_0B.FDB, SRAM3_0C.FDB and SRAM3_0D.FDB files
        from the PCMCIA SRAM card to new folder and rename them SRAM3_0A.FDB,
        SRAM3_0B.FDB, SRAM3_0C.FDB and SRAM3_0D.FDB on the PCMCIA SRAM card
        respectively.

5.1
Eject the PCMCIA SRAM card your computer and insert it into the control.
Cursor down to #5 SRAM DATA
Press "SELECT"
With #2 SRAM DATA RESTORE highlighted, press SELECT
Press "Y"
When all files have been restored, exit BOOT menu; you can also cycle the control power.

5.2 Set Options to Re-Size Your Memory

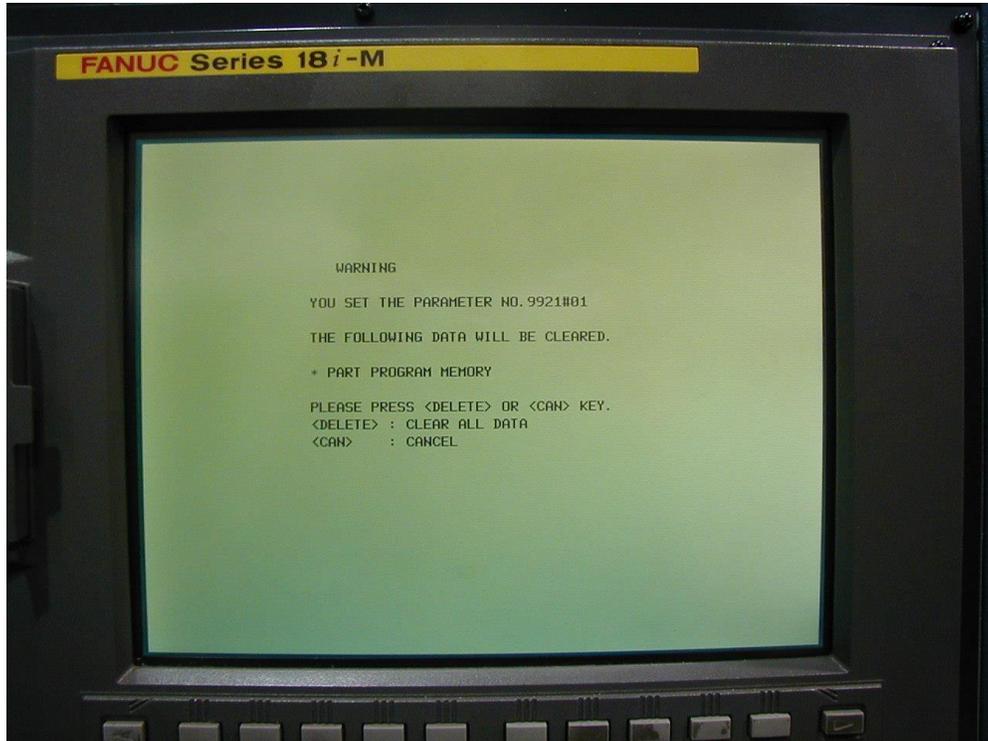Press OFFSET SETTING key TWICE.

Set PWE to one, turning it on.

Press SYSTEM.

Press 9921 and then NO SRH

Set bit 4, 3, 2, 1, 0 to ZERO. DO NOT CHANGE bits 7, 6, 5 however. (P9921= "xxx0 0000")

If and of these bits were on and you have turned one off, you will now get a warning screen that says you will lose information.

Press DELETE (so it accepts that change).

NOW SET ONE OF THE FOLLOWING MEMORY PARAMETERS:

With PWE on, in MDI mode and Parameters 9921 reset, you then set:

(A) Parameter 9943, bit 6 to 1 for 512k (P9943 = "x1xx xxxx"), or set it to "0" & set

(B) Parameter 9953, bit 2 to 1 for 1 megabyte (P9953 = "xxxx x10x"), or set

(C) Parameter 9953, bit 1 to 1 for 2 megabytes (P9953 = "xxxx x01x").

Additionally, you can also turn on parameter 9920, bit one, to a one.
This allows the G10 tool offsets to be inputted.

Reset PWE to 0 after you are done.

You still have a "000 Alarm – Power Must Be Off"

Turn control OFF and then ON.

Your control should come up fine with the new memory size. If so, jump to **section 5.4** to Re-Load Your Part Programs and 8000/9000 Macro Programs:

5.3 To Re-Load Your PMC Parameters:

Press SYSTEM key.
Press PMC, PMCPRM, KEEP RL.

Cursor to K17 and set bit one, to ONE by keying in 10 and INPUT.
        (Note if you have more than 20 Keep Relays, page down & change 900.1 to a 1 instead
        of K17.1=1. Also make sure you stop the ladder when reloading PMC parameters)

Press left soft key.
Press I/O
Press M-CARD.
Cursor down to FUNCTION and press READ soft key.

Input the file name you created on the M-Car for the PC parameters, by keying in @ PMC – RB PRM.

Press EXEC.

Turn control OFF and ON.

Take control out of E-STOP.

Press SYSTEM and then enter 3202 and press NO.SRH.

At parameter 3202, turn bit 4 and bit 0 to Zero.

Press OFFSET SETTING key TWICE to bring up PWE and set it to zero (OFF).

Then press RESET to clear your alarm.

5.4 To Re-Load Your Part Programs and 8000/9000 Macro Programs:

Make sure PWE is off and there are no alarms.

Select EDIT mode.
At this point you must confirm that the MEMORY PROTECT key lock switch is OFF.

Press PROG, "+", CARD, OPRT, F READ.

Now enter the **file number** – not the **file name** (e.g. **O**0009), for the file you named 33, to re-load this batch of files.

Press F SET.
Press EXEC.

If all seems OK with the control, jump to section 5.8 to reset the 8000/9000 protection, otherwise reload the system files from your backup as follows…

5.5 Optionally To Re-Load Macro Variables:

(By way of explanation, there are two steps to this: You have to input the macro file saved earlier in to the control, and then execute that file.)

Press F READ

Input the MACROVAR.DAT file number from the SRAM card.

Press F SET.

Then give it a file number for the control (such as 20).

Press O SET.

Press EXEC.

5.6 Optionally To Execute the Macros (if not loaded):

Go to MEM MODE.

Press PROG. This should bring up the macro program, because it was the last thing you entered. If not, select macro from the directory.

Press the OPRT soft key.

Press the O SRH soft key to select the MACRO program number (20, if you used 20).

Press CYCLE START.

This re-loads the macro settings.

5.7 Optionally To Re-Load Offset Data:

Press OFFSET SETTING key TWICE.

Press OPRT, "+", READ, EXEC.

Like the macro file, this offset needs to be run like a program to automatically set the offsets.

5.8 Re-Protect the 8000/9000 Macro Programs

The Last thing to do is RE-LOCK parameter 3202, bit 4 and bit 0 (Changing them to ONE)

This protects the 8000 and 9000 programs.

… To do this, select MDI mode.

Press OFFSET SETTING key TWICE.

Bring up PWE and set it to one (turn it on).

Press SYSTEM key.

Find parameter 3202 and turn on bits 4 and 0.

Press OFFSET SETTING key.

Bring up PWE again, and turn it off (set it to ZERO).

Check the operation of your control completely…

5.9 Absolute Encoder Note:

Note: If you have absolute encoders and you get a 300 APC Alarm, you may need to reset the absolute encoders. With PWE on in MDI mode, set Parameter 1815 bit 4 on all axes to 0. Reset PWE to 0. Hit reset to clear alarms. Home the control manually and check that P1815 bit 4 is back to a 1 (if it is not set PWE and make it a 1 in all applicable axes). With PWE off, hit RESET to clear all alarms.

CONGRATULATIONS YOUR FANUC iA SERIES MEMORY UPGRADE IS NOW COMPLETE.

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