

# FF201

## Control Module Instruction Manual

Control Module  
For  
Flash Microcomputer Programmer  
(NET IMPRESS)

Target Microcomputer: MB90F543 (F<sup>2</sup>MC16LX Series)

YDC Corporation

This control module is made of a battery back-up type SRAM PC card and life of the battery is about 3 years in a room temperature. It is recommended that the battery for the PC card be changed in every 2 years.

Note the following in using the control module.

- ◆ **DO NOT** store your files in the control module for permanent storage. Use the DOS area as the temporary storage area of your files.
- ◆ When changing batteries of the control module, be sure to set it into either the NET IMPRESS or a personal computer and keep its power on so as to protect the definition program of the control module.

**FF201 (MB90F543)**  
**INSTRUCTION MANUAL**  
**No. M2320ZE-01**

**Revision History**

<b>Edition</b>	<b>Publication Date</b>	<b>Changes</b>
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## 1. Overview

The FF201 is a control module for the NET IMPRESS, an advanced on-board flash microcomputer programmer.

The FF201 supports programming the flash ROM of Fujitsu MB90F543 and programming other equivalent flash microcomputers that have the same programming algorithm and protocol as Fujitsu MB90F543.

The control module consists of a PC card containing the programmer control software. The free area of the PC card can be used as the DOS file system area to store your object file created on the host computer.

The five types of the control module are available for your choice: /P2, /P4, /P5, /P8 and /E6. Choose a type of the control module according to capacity of your target flash memory. /P2 supports up to 128Kbyte of the flash memory, while /P4 supports up to 512Kbyte of the flash memory, /P5 for up to 768Kbyte, /P8 for up to 1Mbyte and /E2 for up to 2Mbyte.

Four types of the probe cable are available as the standard; AZ210 ~ AZ213. For probe cables of other types, consult with YDC or your local distributor.

### NOTES:

With this control module, you can program Fujitsu MB90F543 and other equivalent flash microcomputers that have the same programming algorithm and protocol as the target microcomputer. When you use this control module for microcomputers other than the target microcomputer and its equivalent microcomputers, you need to modify some of parameters in the control module using the optional remote controller (AZ290). For modifying parameters, see the Section 5 of this manual.

The FF201 is designed to support programming microcomputers of a wide range and you can program a microcomputer of different programming voltage (Vpp) by changing parameters. Be sure to have good understanding on signals connection by carefully reading the Section 3 "Connecting to the Target System and Connector" before you use the control module.

Check once again with the below listed checkpoints if your microcomputer is supported by this control module, or if your microcomputer has the same algorithm and protocol as those of the target microcomputer.

- a. Is a programming method of your microcomputer the same as the one of the target microcomputer?
- b. Are the programming voltage (Vpp) and write control algorithm of your microcomputer the same as those of the target microcomputer?
- c. Is the communication protocol for programming control of your microcomputer the same as the one of the target microcomputer?
- d. For a microcomputer that uses the RAM loading type write control program, does it have an appropriate write control program? Also, are the specifications of the write control program same as those of the target microcomputer?

Contact us or your local distributor for any questions or unclear points.

### CAUTION:

Using the control module that does not support the programming method of your microcomputer would lead to serious damage to your microcomputer and target system.

## 2. Specifications

### 2.1. Target Microcomputer and Specifications

For any items that are not specifically noted here, the NET IMPRESS' standard specifications are applied.

Control Module	FF201
Target Microcomputer	MB90F543
Flash Memory Capacity	128 Kbyte
Flash Memory Address	#FE0000 ~ #FFFFFF
Programming Voltage (Vpp)	4.5V ± 5.25V *1
Default	5.0V
VCCp (Minimum target voltage during programming)	1.5V
Object File Format	Motorola S Binary Intel HEX
Default	Motorola S
Target Interface	CSI Interface 62.5K, 125K, 250K, 500K, 850K, 1.25Mbps MSB first                      LSB first
Data Transfer Format between Flash Writer and Target System	Binary
Memory status when erased	#FF
MCU Clock during programming	2.0MHz – 16.0MHz

\*1. When the device functions are not executed, the Vpp output (from the NET IMPRESS) is in the high-impedance state.

## 2. 2. Setting Up Specific Parameters

Perform initialization by using the AZ290, the remote controller running on Windows. For how to use the AZ290, see the Remote Controller AZ290 Instruction Manual.

### 2. 2. 1. Parameter Table1 Tab

Set up the parameters for your target microcomputer with the Parameter Table1 tab.

Remote Control Mode Version 3.3.1

MCU TYPE **FL201** MODEL CODE **FL001** Port No. **TCP/IP**

Parameter Table 2 Application-Read File Transfer

Host Interface Configuration Basic Operation **Parameter Table 1**

MCU Type (FUNC D8) **FL201** MCU Clock Frequency (FUNC DF) **1** [MHz]

TVcc Threshold (FUNC D3) **4.5** [V] MCU Operation Mode (FUNC D4) **0003**

**Flash ROM**

First Address (FUNC D6) **000F4000**

Last Address **000FFFFF**

**ROM Block Configuration**

Group No.	Start Address	Block Size (byte)
Group 1	<b>000F4000</b>	<b>00004000</b>
Group 2	<b>000F8000</b>	<b>00008000</b>
Group 3		
Group 4		
Group 5		
Group 6		
Group 7		
Group 8		
Group 9		
Group 10		
Group 11		
Group 12		
Group 13		
Group 14		

**Data Communication**

**FUNC D1**

UART  CSI

**Channel No.(FUNC D7)**

0  1  2  3

UART Baud Rate (FUNC D2) **2400**

CSI Baud Rate (FUNC D9) **1.25M**

**Block Alignment**

Over Write **No**  ON  OFF

BufferRAM Initialize Mode **KEEP**

Save to HD OK Cancel End 10KEY

Note: The above picture is only for an example, and is not an actual operation window of the FF201.

(1) **TVcc threshold [ FUNC D 3 ]**

Set up a value about 10% lower than the minimum operation voltage of the target microcomputer. The NET IMPRESS senses the operation voltage (TVcc) of the target microcomputer and executes the device function when the TVcc gets higher than the specified value.

For setting up TVcc threshold at the side of the NET IMPRESS, see the NET IMPRESS Instruction Manual, Section 5. 4. 5 “TVcc Threshold Setting”.

(2) **Flash ROM (First Address, Last Address) [FUNC D6]**

Set up the flash memory area (First Address, Last Address) embedded in the microcomputer.

You can not set up flash ROM for the NET IMPRESS here and this is only for display.

For details, see the NET IMPRESS Instruction Manual, Section 5. 4. 8 “Flash Memory Area Display”.

(3) **ROM Block Configuration**

Set up the block configuration of flash memory.

< Block Data Table >

The block data table consists of three kinds of information: Group No., Start Address and Block Size.

**Group No:** You can specify up to 14 groups (Group1 to Group 14). A block group consists of memory blocks that have the same one block size on linear address. Group number is determined by the address order starting from lower address.

**Start Address:** A starting address of block group.  
The flash memory of the size specified at the Block Size sequentially continues, forming one block group.

**Block Size:** The NET IMPRESS understands that the flash memory blocks of a size specified at the Block Size are placed sequentially until a next block group address.

For an ending block group, specify '0' for both start address and block size.

Example:

Group No.	Start Address	Block Size
1	#00F80000	#00008000
2	#00FA0000	#00010000
3	#00000000	#00000000

Block Start Address

F80000

F88000

F90000

FA0000

FB0000

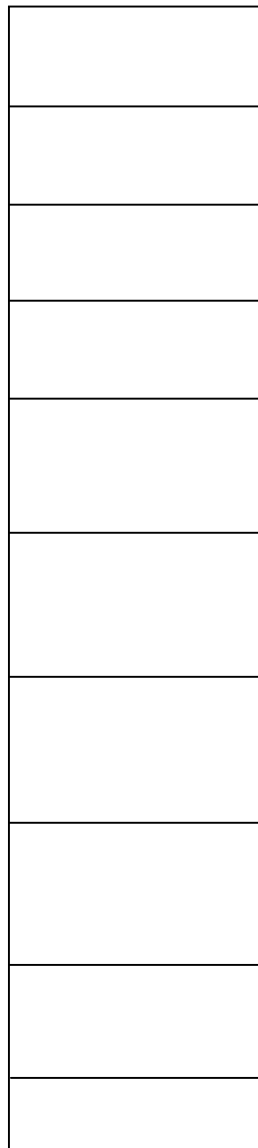
FC0000

FD0000

FE0000

FF0000

0



**Block Group 1**

The above example shows the flash memory block which has 32K block size from #F80000 continues until a next block size starts (#FA0000).

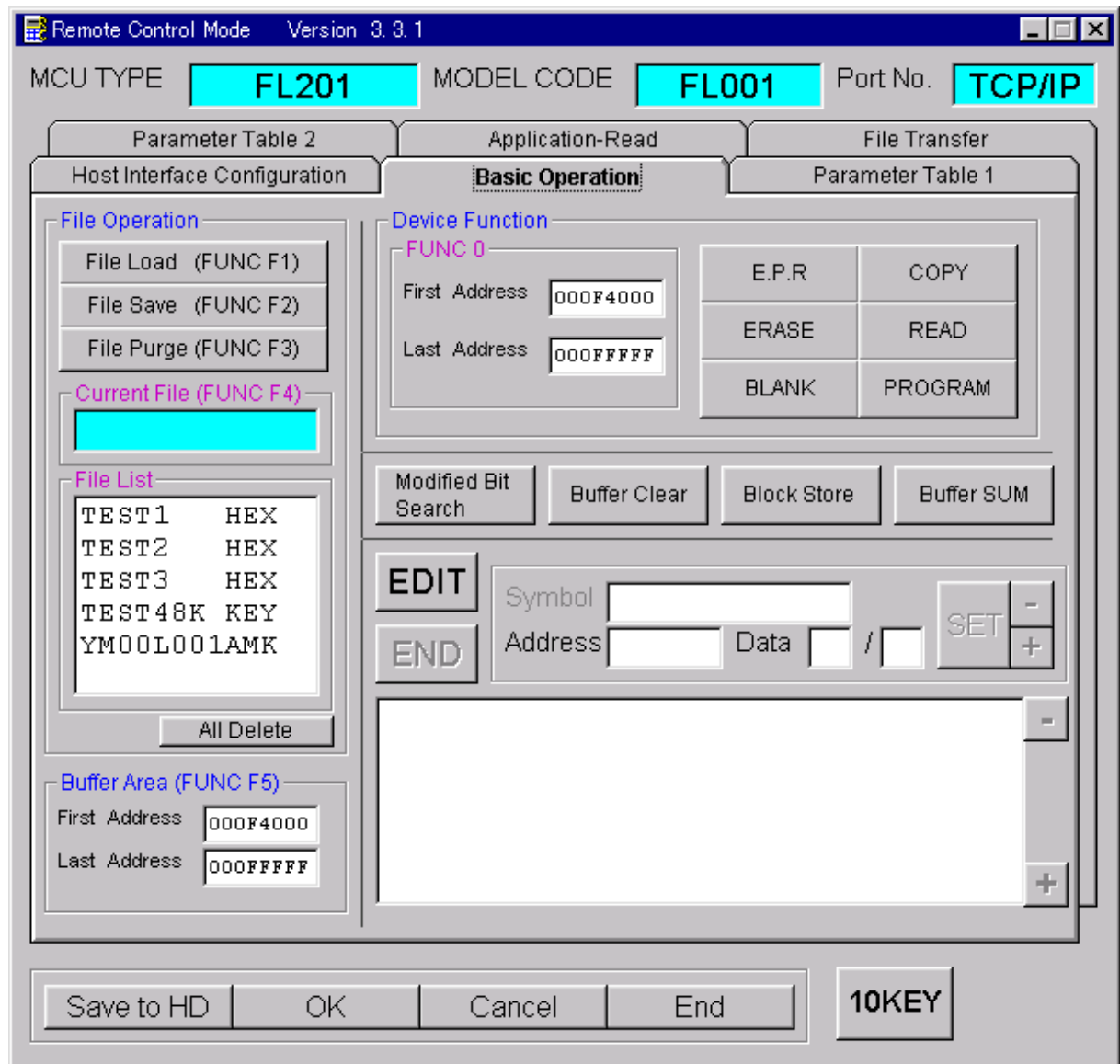
**Block Group 2**

The above example shows the flash memory block that has 64K block sizes from #FA0000 continues until the last address (FFFFFF) of the flash memory.

- (4) **MCU Clock Frequency [ FUNC D F ]**  
For the FF201, this function is not used.
- (5) **MCU Operation Mode [FUNC D 4]**  
For the FF201, this function is not used.
- (6) **WDT Clock Period [FUNC D 5]**  
The NET IMPRESS has the function to output cyclic clock pulse during programming. To use this function, you need to set up clock cycle. The cyclic pulse will be output from the WDT pin (No.18) listed in Table 4.1 “Target Probe Signal List”. For setting up the WDT for the NET IMPRESS, see the Instruction Manual of the Flash Writer, Section 5. 4. 7. “Watchdog Timer Setting”.
- (7) **Data Communication**  
Sets up a communication channel between the NET IMPRESS and the target microcomputer. For the FF201, set up as follows:
- **FUNC D 1**  
Select **CSI**.  
For setting up a communication method with the NET IMPRESS, see the Instruction Manual of the Flash Writer, Section 5. 4. 2. “Communication Channel Setting”.
  - **Channel No. [ FUNC D 7 ]**  
Select **1**.  
For setting up communication channels with the NET IMPRESS, see the Instruction Manual of the Flash Writer, Section 5. 4. 9. “Communication Channel Setting”.
  - **UART Baud Rate [ FUNC D 2 ]**  
For the FF201, this UART Baud Rate will not be used.  
For setting up UART Baud Rate with the NET IMPRESS, see the Instruction Manual of the Flash Writer, Section 5. 4. 3. “UART Baud Rate Setting”.
  - **CSI Baud Rate [ FUNC D 9 ]**  
Select 1.25M (1.25Mbps).  
For setting up CSI Baud Rate with the NET IMPRESS, see the Instruction Manual of the Flash Writer, Section 5. 4. 4. “CSI Baud Rate Setting”.
- (8) **Over Write, Block Alignment**  
These are not user-specified items and it is not necessary to change them.
- (9) **MCU Type [ FUNC D 8 ]**  
The setting here will be displayed in the MCU TYPE field located at the top left of the Remote Control Mode window and the NET IMPRESS. You can enter any characters up to seven such as microcomputer’s model name or device name you are using.
- (10) **OK**  
By clicking this “OK” button, you can send the settings on the Parameter Table 1 tab into the control module. Be sure to click the OK button before moving to other tabs so that you can make the changes of (1) – (9) valid. If you do not click the OK button, the changes will not be sent to the control module.

## 2. 2. 2. Basic Operation Tab

Set up the following three items with the Basic Operation tab.



Note: The above picture is only for an example, and is not an actual operation window of the FF201.

(1) Device Function [FUNC 0 ]

Set up the areas to execute the device functions such as reading, programming, etc.

Normally, set up the same areas as those you set up for the Flash ROM as described in the Section 2. 2. 1 (2).

The Device Function Address [FUNC 0] is automatically aligned with the block boundary address of the flash memory by its specified address as shown in Figure 2-2-2-1. The device functions will be executed to thus automatically aligned area.

(2) Buffer Area [FUNC F 5 ]

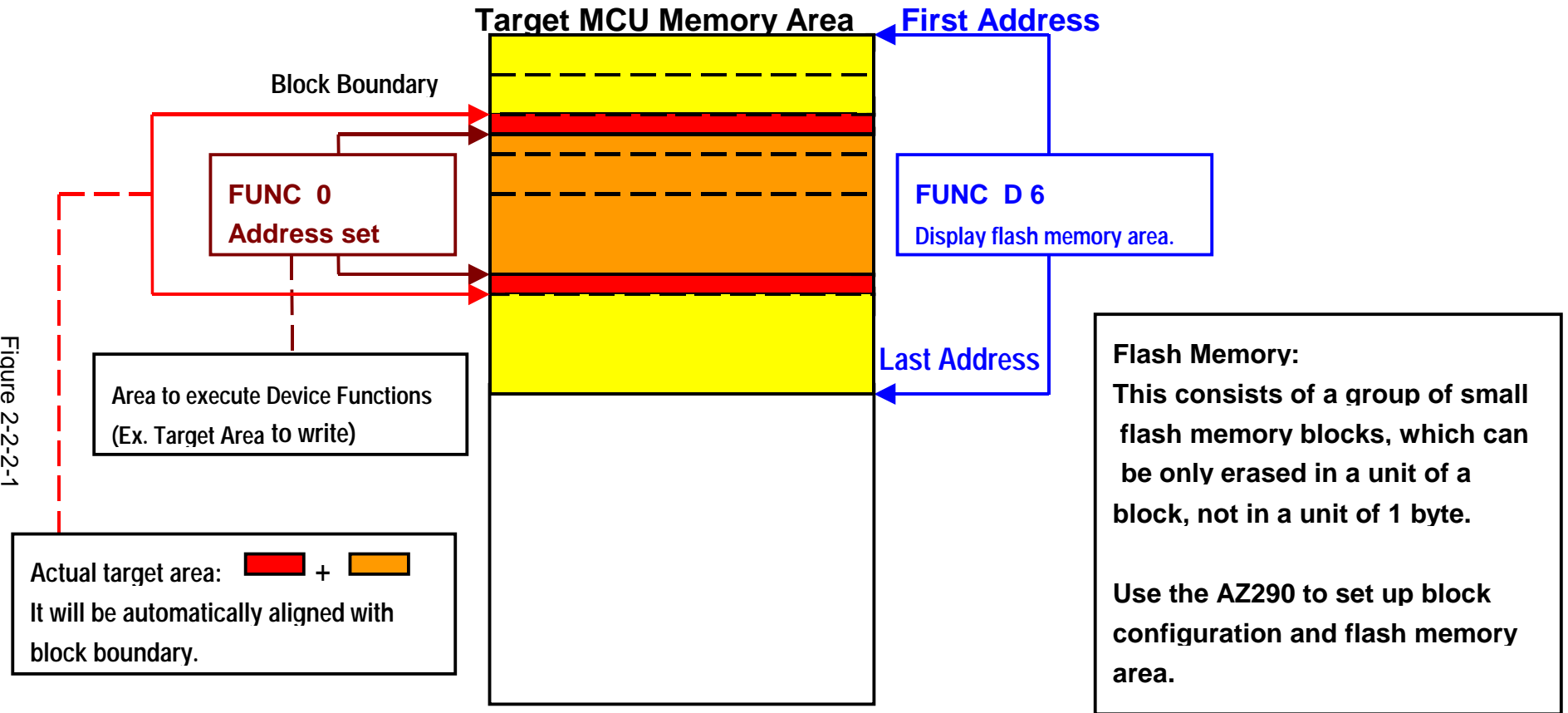
Set up the areas to save and load the data on the buffer memory of the NET IMPRESS (when you have a binary file). Normally, set the same areas as those for the Flash ROM as described in the Section 2. 2. 1 (2).

Figure 2-2-2-2 shows how the Device Function [FUNC 0], Buffer Area [FUNC F 5] and Flash ROM Area [FUNC D6] relate with each other.

(3) OK

By clicking this “OK” button, you can send the settings on the Remote Control Mode tab into the control module. Be sure to click the OK button before moving to other tabs so that you can make the changes of (1) – (2) valid. If you do not click the OK button, the changes will not be reflected.

Figure 2-2-2-1  
11



**FUNC 0** Address Set & Address Alignment

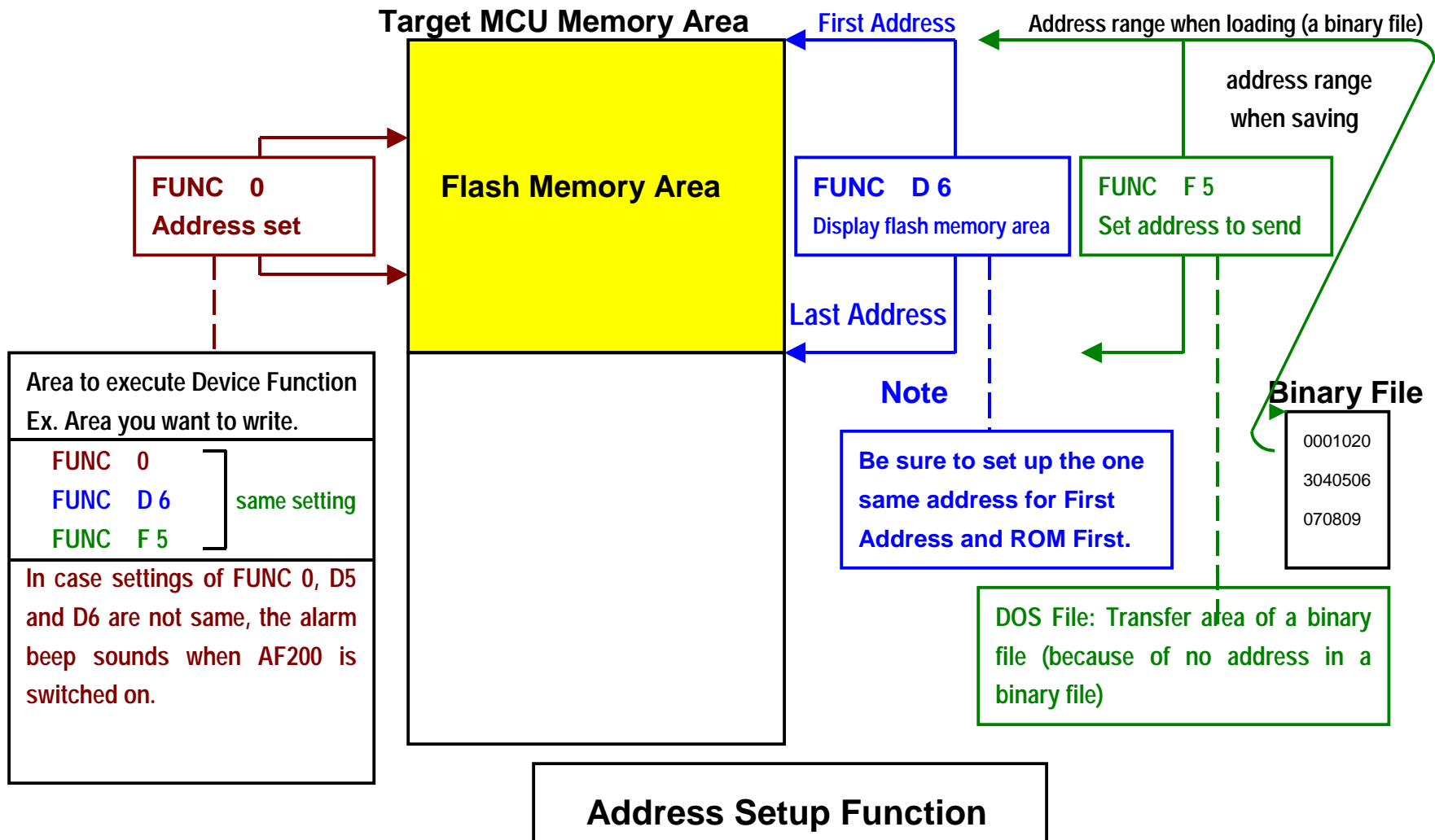
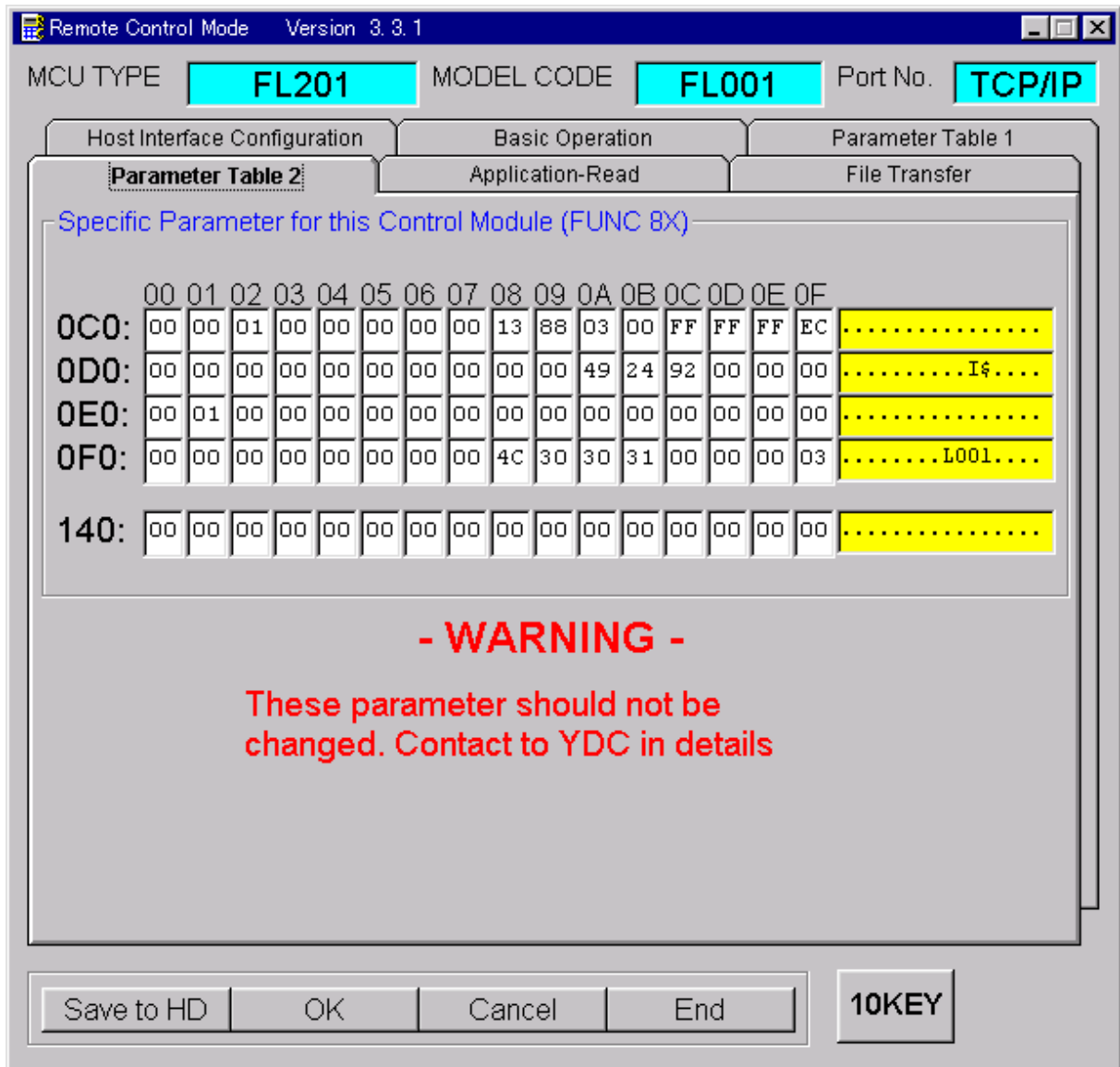


Figure 2-2-2-2

### 2. 2. 3. Parameter Table 2 Tab

Be sure not to change any value set up in this window, as this window contains the parameters specific to the microcomputer. In case you need to change the settings, please contact our Support Center in advance.



Note: The above figure is only for an example, and is not an actual operation window of the FF201.

### 2. 3. Device Functions and Their Operation

The table below shows the operations to the Flash Memory that are executed when the NET IMPRESS starts the device functions.

Device Function		Erase	Blank Check	Program	Read	E.P.R	Copy
Target Memory Area	FUNC 0 Command (with Block Alignment)	○	○	○	○	○	×
	FUNC D 6 Command	○	○	○	○	○	○
Operation to Flash Memory		Erase Blank	Blank	Erase Blank Program Read *1	Read	Erase Blank Program Read *1	Copy Read
Notes:							

\*1: For the Read Verify operation that is executed by the device functions E.P.R and Program, the Read Verify set up with the Read Verify mode (FUNC 99) is executed. To set up the Read mode with the NET IMPRESS, see the NET IMPRESS Instruction Manual, Section 5. 4. 19. "Read Mode Switchover".

(1) SUM READ VERIFY: Compares the programmed data in the MCU with the buffer RAM data.

(2) FULL READ VERIFY: Compares the checksum values received from the MCU with the checksum values of the buffer RAM.

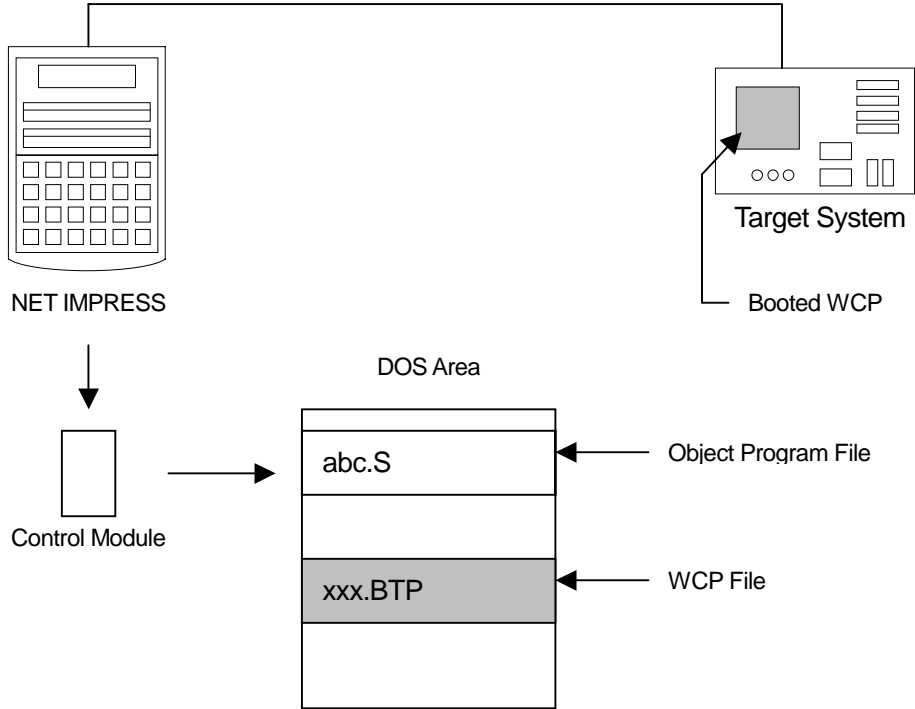
### 3. Copying Write Control Program into Microcomputer

#### 3. 1. Overview

For using the control module, the write control program (WCP) has to be sent to the target microcomputer to run on it before execution of the device functions. The microcomputer executes the programming sequence under this write control program.

Copy the write control program into the DOS area of the control module and save it under a file name with the “.BTP” extension beforehand.

Only one file with the extension “.BTP” can be placed in the DOS area of the control module. Also, the control module can not be used without a file having the “.BTP” extension.



### **3. 2. How to Copy the File with .BTP Extension**

From the Utility Assy provided with the control module, select an appropriate write control program that has conditions matching with the target microcomputer.

Perform the following steps to save the file with “.BTP” extension in the DOS area of the control module.

- (1) Set this control module in a personal computer that has a PCMCIA card slot. Make sure that the PC card driver has been properly installed in advance. For how to install the PC card driver, see our Web site at the following URL.

[http://www.ydc.co.jp/micom/index\\_E.htm](http://www.ydc.co.jp/micom/index_E.htm)

See also the Q & A page of the flash microcomputer programmer.

- (2) Copy the write control program (xxx. BTP) from the Utility Assy into the DOS area of the FM202 control module.

## 4. Connecting to the Target System and Connector

### 4. 1. Signal List

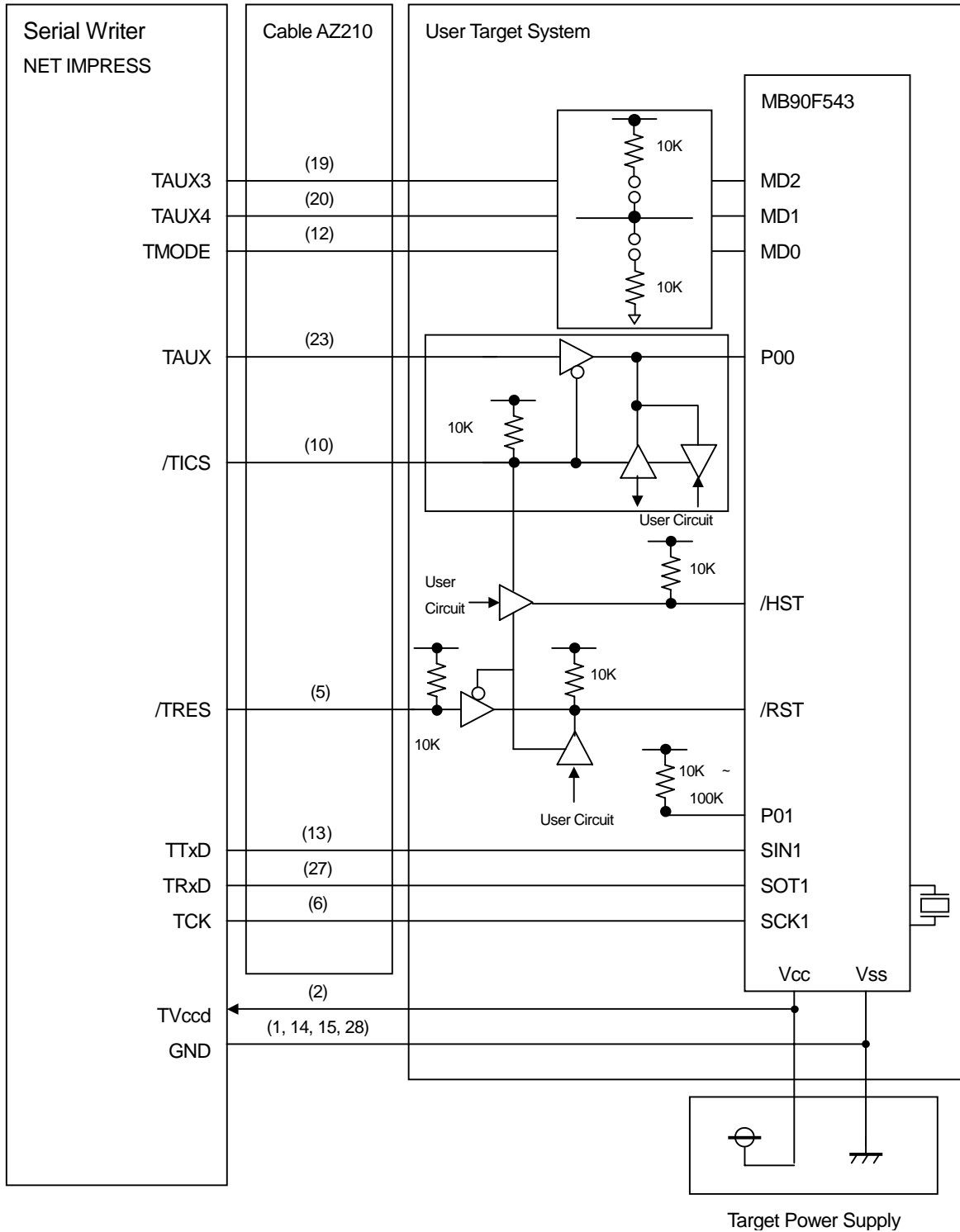
The below table lists the target probe connector signals to use the control module FF201.

CPU Signal	NET IMPRESS Standard Signal				CPU Signal
GND	GND	1 5	1	GND	GND
Reserved	TVpp1	1 6	2	TVccd	Target Vcc
	TVpp2	1 7	3	Vcc	
	WDT	1 8	4	TRES	
MD2	TAUX3 TVpp1c	1 9	5	/TRES	/RESET
MD1	TAUX4 TVpp2c	2 0	6	TCK	SCK1
	Reserved	2 1	7	Reserved	
	Reserved	2 2	8	Reserved	
P00	TAUX	2 3	9	TAUX2 (TRW)	
	TBUSY	2 4	1 0	/TICS	
	T10	2 5	1 1	TAUX5 (TOE)	
	TVccs	2 6	1 2	TMODE	MD0
SOT1	TRxD	2 7	1 3	TTxD	SIN1
GND	GND	2 8	14	GND	GND

Target Probe Signal List (FF201)

- Signals marked with “○” “ must be connected to the target system.
- Signals marked with “◌” “ are being controlled for output. Connect them only when necessary.
- Signals marked “Reserved” are not used with this control module FF201. **Be sure not to connect them with a circuit of the target system.**

## 4. 2. Model Connection to Target System



Example of Connecting with Target System

(1)

- For the signals defined as shared terminals, multiplexing circuit of these signals must be provided to the user system.
- /TICS signal is asserted only when the NET IMPRESS is performing the device functions.
- /TICS signal multiplexes the signals connected to these shared terminals.
- Multiplexing circuits are not required for the target system, where these signals for write control are defined only as the control signals for the flash microcomputer.
- Inserting the multiplexing circuit into the user system causes the state where the NET IMPRESS is unconnected (i.e., the connector is unplugged) while /TICS signal is being negated.

(2) WDT Signal:

- The clock signal defined by pressing  FUNC  D  F is generated from WDT signal terminal by the NET IMPRESS. (The clock signal will be generated only while /TICS is asserted: Cr-OPEN type output)
- Connect this /TRES signal to the user circuit that requires the appropriate clock signal while programming the flash memory.

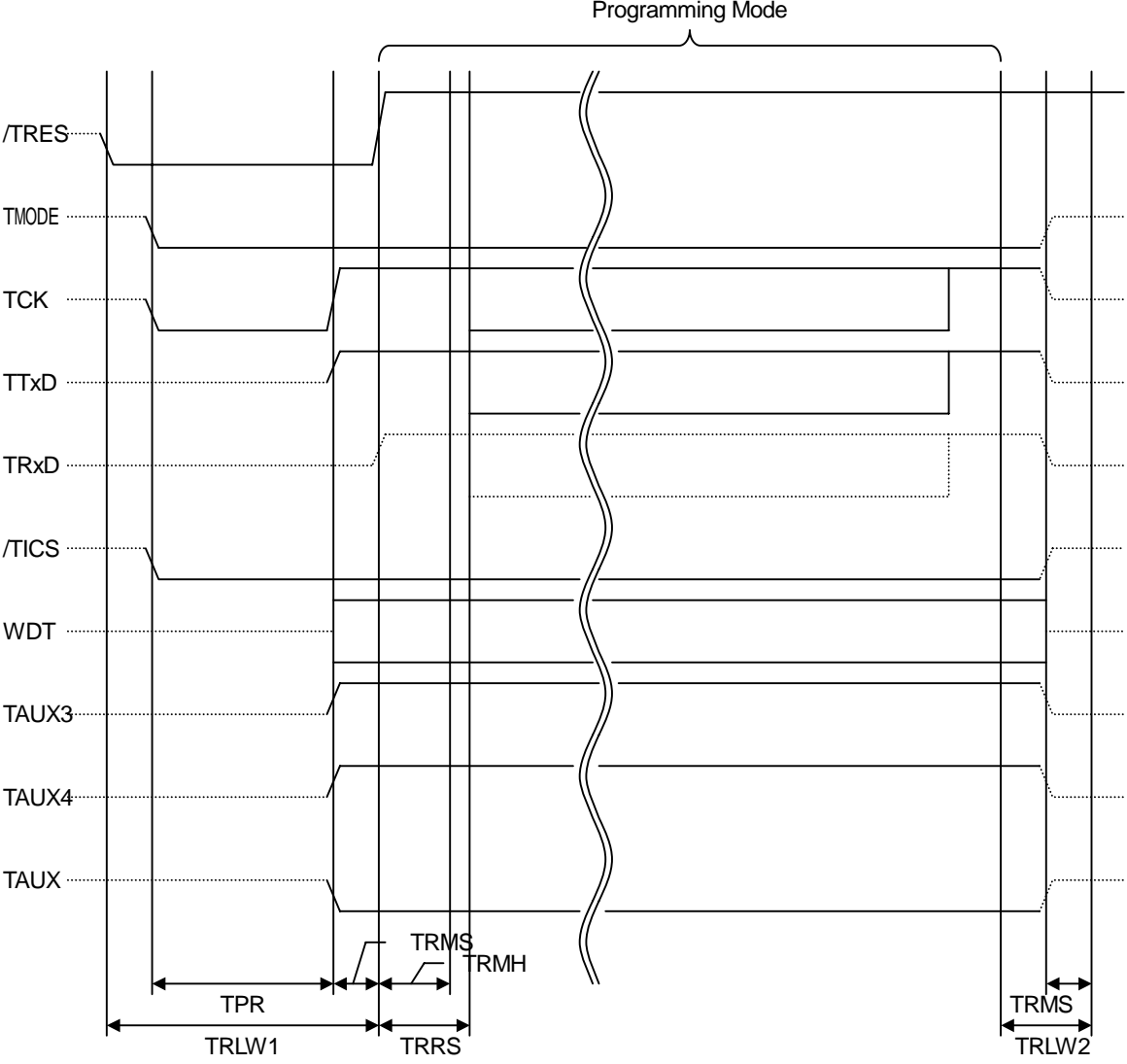
(3) TRES Signal:

- The NET IMPRESS has /TRES signal in its standard probe.
- /TRES signal is an open collector type output so that it can be connected to /RESET terminal of your microcomputer using the user circuit.
- TRES signal can be used when the target system requires a positive RESET signal. TRES signal is the totem pole output type signal.

(4) MD0, MD1 and MD2 Signals

- The MD0, MD1 and MD2 at the side of the user target system are the terminals that set up an operation mode of a microcomputer you will use.
- When you program the flash memory, signals for the flash programming mode will be output to these signals from the NET IMPRESS.
- To set up an operation mode, pull up or pull down these signals with about 10K $\Omega$  resistors.

### 4. 3. Waveform of Control Signal



The dotted line “ ..... ” indicates HIZ state.

	MCU Specification	NET IMPRESS Specifications
TRLW1		300ms (min.)
TRLW2		100ms (min.)
TPR		200ms (min.)
TRMS		50ms (min.)
TRMH		90ms (min.)
TRRS		100ms (min.)

- (1) Turn on power of the NET IMPRESS first and then the target system.
- (2) /TICS signal is asserted by execution of the program command, and communication channel for programming is connected to the NET IMPRESS on the target system. (For a system where communication channel and related signals for programming are used only by the NET IMPRESS, independently from other user circuits, multiplexing with this /TICS signal is not required.)
- (3) The NET IMPRESS applies TVpp.
- (4) The NET IMPRESS asserts a reset signal to pull the target microcomputer into the programming mode. Then, the NET IMPRESS raises TVpp1 to a specified voltage.
- (5) The programming mode, upon being executed, starts communicating with the NET IMPRESS using a specified communication circuit.

Channels specified by pressing    in advance will be selected for communication circuit.

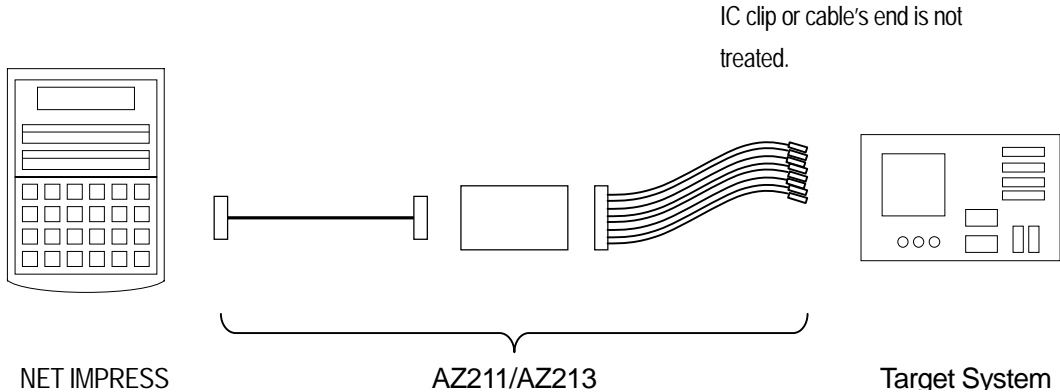
- (6) When programming completes, the NET IMPRESS automatically completes applying TVpp1.
- (7) The NET IMPRESS also negates /TICS signal. While /TICS signal is asserted, WDT signal continues to generate periodic pulse signal (the clock to input to a watchdog timer of the target system).

### 4. 4. Probe

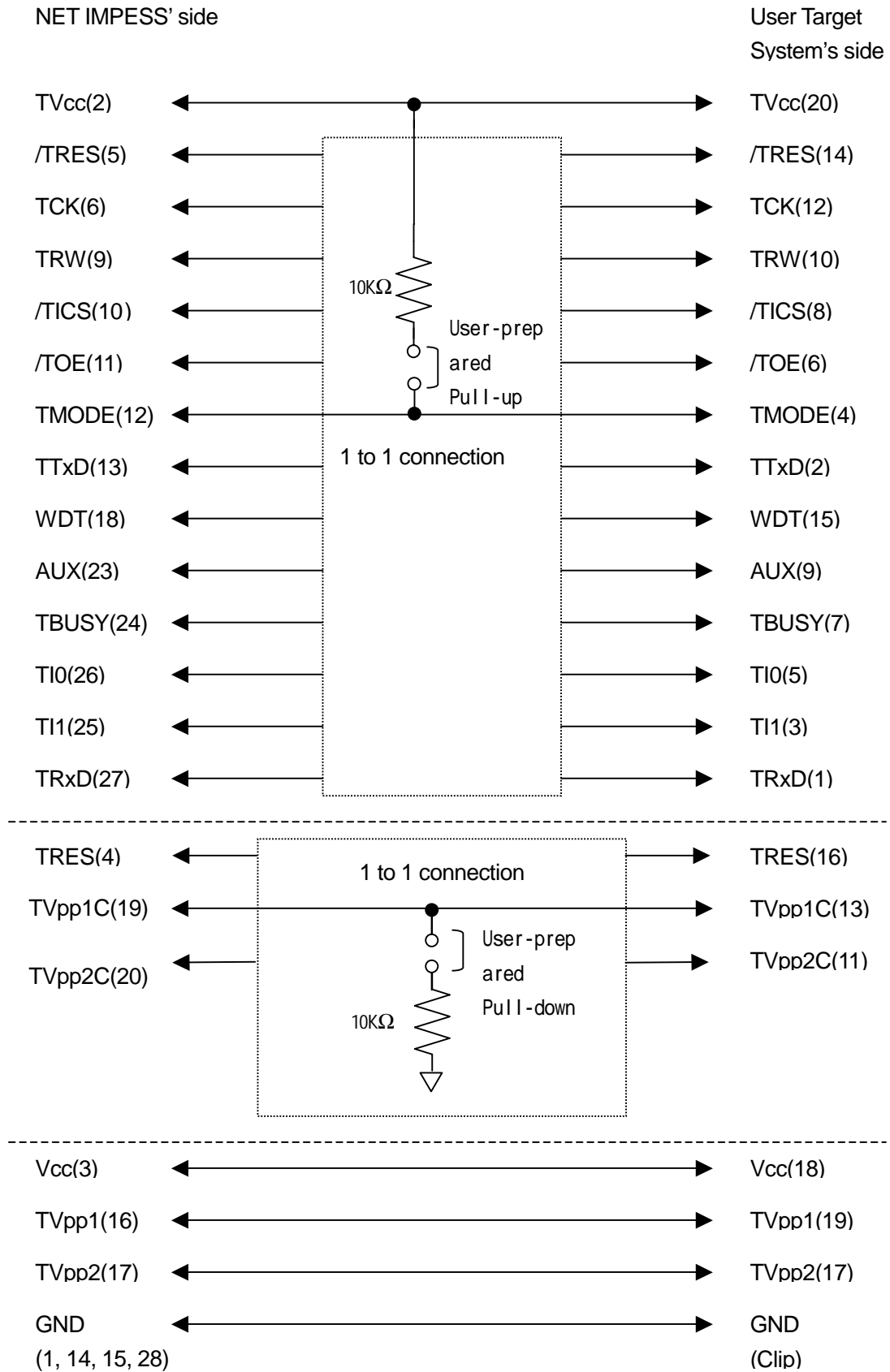
As the standard probes, four types of the probe (AZ210, AZ211, AZ212 and AZ213) are available for an additional order. Please contact us or your local distributor for the probe. For a connection diagram of each probe, see the NET IMPRESS Instruction Manual, the Section 8. 6. "Target Interface", or our Web site.

### AZ211/AZ213

The NET IMPRESS' most of I/O lines have 100KΩ pull-down resistors between the GND line and signal lines. Also, control lines from the NET IMPRESS that are used on the target system must be kept negated not to disturb the target system when connectors for the NET IMPRESS are removed. It is recommended to either pull up the power or pull down the GND signal for these control lines with about 10KΩ resistors on the user system. In case the pull-up resistor cannot be added to the control signals within the user system, use either AZ211 or AZ213 which is available for an additional order. AZ211 and AZ213 enable you to optionally add pull-up/pull-down resistors to the control lines running from the NET IMPRESS.



# AZ211 /AZ213



## **5. Adapting to Derivative Microcomputers -Parameter Modification-**

You can modify parameters in the following two ways.

### **5. 1. Minor Parameter Modification through the Keyboard of NET IMPRESS**

The parameters that are defined by the function commands (FUNCTION D1 ~ FUNCTION DF) as described in the NET IMPRESS Instruction Manual, Section 5.4 “Parameters Settings” can be modified through the keyboard of the NET IMPRESS. (For example, parameters for communication interface with the target system, voltage of the target system, etc. can be modified through the keyboard of the NET IMPRESS.)

NOTE:

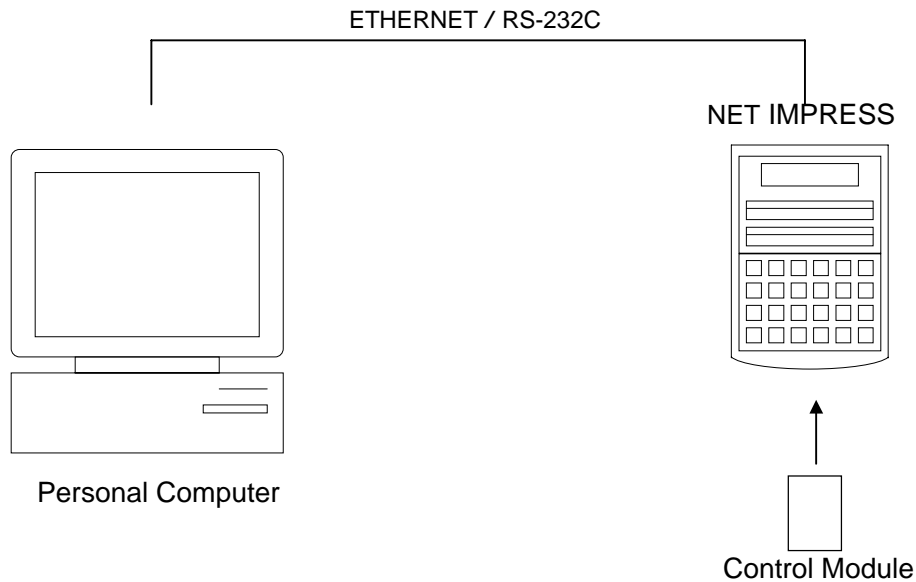
ROM block configuration of flash ROM address (FUNCTION D6) cannot be modified through the keyboard of the NET IMPRESS. For modifying parameters and settings of the target microcomputer, it is recommended to use the remote controller AZ290 that is available for an additional order.

### **5. 2. Modifying Parameters for Target Microcomputer - by Using Remote Controller -**

The remote controller software AZ290 for controlling the NET IMPRESS remotely from a PC is available for an additional order. This remote controller has also the function to set up and confirm parameters. With the remote controller, you can set up parameters and modify them including the following.

- MCU Type: Target microcomputer’s name  
The microcomputer’s name displayed on the LCD of the NET IMPRESS can be customized.
- Flash ROM Area: Flash memory area of the target microcomputer
- ROM Block: Flash memory block alignment can be set up with the block group’s address and size, enabling you to use the control module with derivative microcomputers.
- MCU Clock: MCU clock frequency
- Communication Interface: You can set up a communication interface with the target system.
- Other specific information defined by the control module (i.e., parameters specified by pressing    )

### 5. 3. How to Modify Parameters Using Remote Controller Software (AZ290)



Connect a personal computer (IBM PC) and the NET IMPRESS using ETHERNET cable (10BASE-T) or RS-232c cable.

Insert the control module matching with the target microcomputer into the NET IMPRESS' card slot.

The parameter table of the control module inserted in the NET IMPRESS can be customized from the PC by running the remote controller. (By running the remote controller on a Windows PC, you can modify or check parameter tables of the control module inserted in the NET IMPRESS.)

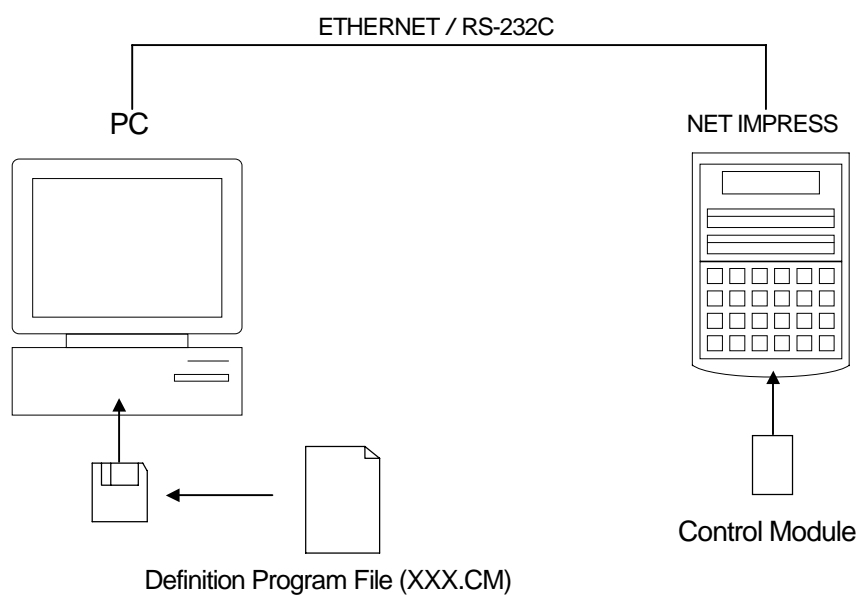
With the remote controller, you can load and save parameters. Since parameter information generated with the remote controller can be saved in the PC, you can easily modify parameter tables for various derivative microcomputers of the same family.

Also, using this function, you can easily load the microcomputer pack that you download from our Web site into the control module.

## 6. Replacing Definition Program

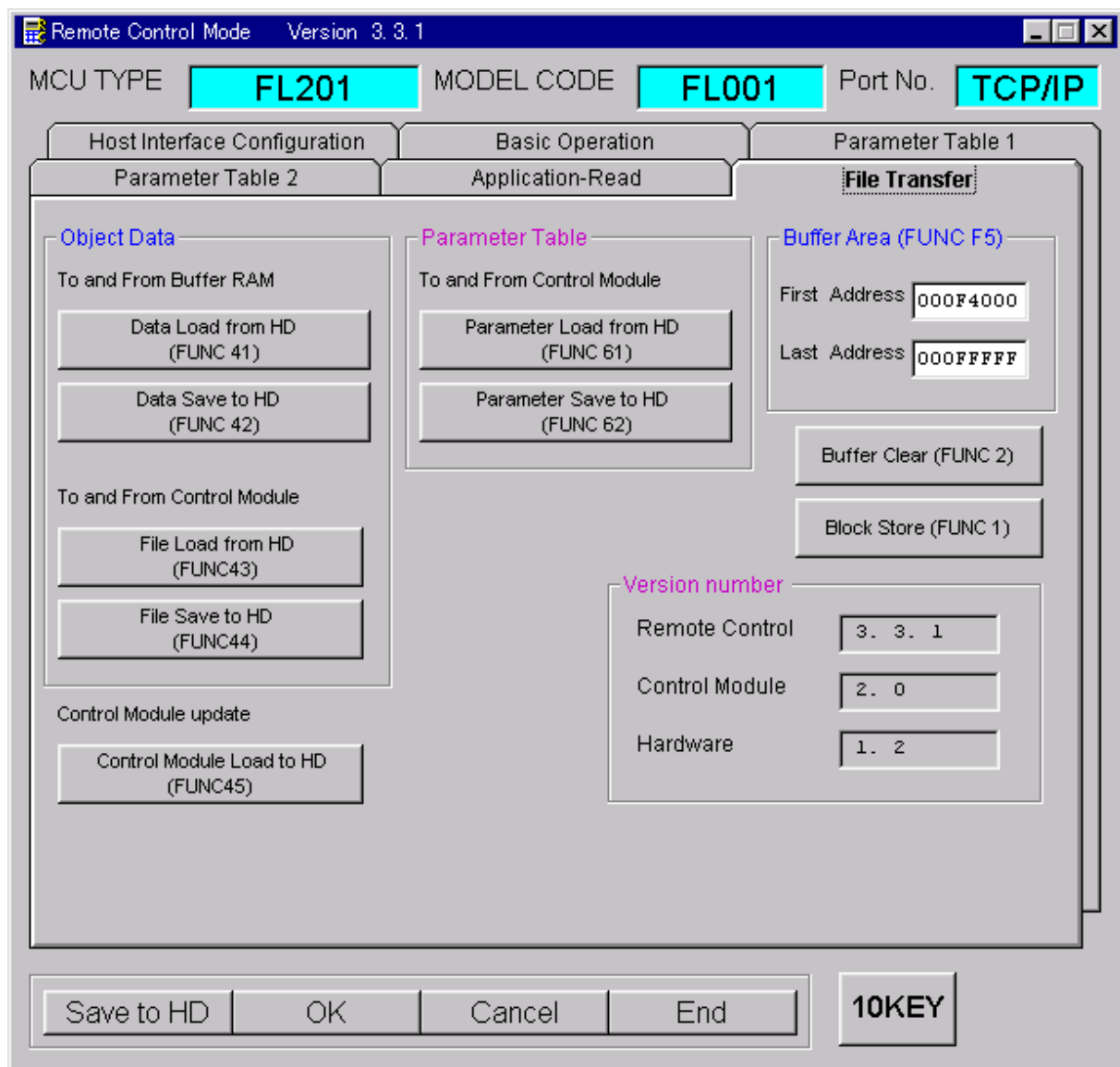
### 6. 1. Overview of Definition Program Replacement Function

The IMPRESS module has the function to support programming microcomputers of different programming specifications from those of the target microcomputer, by replacing the definition program. You can quickly replace the definition program using the definition program download function of the remote controller AZ290, without changing the control module. With this definition program replacement function, you can replace with other IMPRESS module to program microcomputers of different programming specifications by adding a definition program license to the IMPRESS module. (You can add a definition program license to the IMPRESS module of the control module /P4 or greater version.) The definition program license is available for your additional order. If you have any questions, please contact us or your local distributor.



## 6. 2. How to Replace Definition Program

By setting the IMPRESS module added with a definition program license into the NET IMPRESS, you can replace the definition program of the control module using the definition program download function (Control Module Load to HD button on the File Transfer tab) of the remote controller AZ290. (Please note that you can not use this function when you use the NET IMPRESS as stand-alone.) When you purchase a definition program license, download the definition program file (“xxx.CM”), which is in the floppy disk provided with the definition program license, into the IMPRESS module.



Note: The above figure is only for an example, and is not an actual operation window of the FF201.

## 7. Notes and Cautions for Using Control Module

- (1) This control module is built for our flash microcomputer programmers. *DO NOT* use this control module for any flash microcomputer programmers other than our flash microcomputer programmers AF200 or NET IMPRESS and its equivalent microcomputer programmers.
- (2) This control module is built tailored for the specific microcomputer. Do not use this control module for programming microcomputers other than the specified microcomputer. Using this control module for microcomputers other than the specified microcomputer would damage your target system.
- (3) The NET IMPRESS consumes power of several mA from Tvcc terminal to drive the interface IC.
- (4) When changing batteries of the control module, be sure to set the control module to either the NET IMPRESS or a personal computer and keep its power on. Life of batteries is about 3 years in normal room temperature, and it is recommended to change batteries every 2 years. The control module is made of SRAM PC card and keeps data with back-up batteries. If you remove batteries from the control module when the NET IMPRESS is not turned on, the data will be cleared, resulting in serious damages of the control module.
- (5) The write protect switch of the control module (PC card) must be set to OFF to use the control module.
- (6) *Be sure NOT to initialize (format) the control module (PC card).* The control module contains the definition program (the control program), besides the DOS area where you can save your files. Initializing the control module results in destroying this control program.
- (7) *DO NOT* eject the control module during the read and write operation to the control module (SRAM PC card). Ejecting the PC card during the operation would cause a serious damage to the information in the PC card. You must not remove the PC card from the flash microcomputer programmer while accessing it. Be sure to press the RESET key before ejecting the PC card.
- (8) Use the flash microcomputer programmer with the control module inserted into it.