

# *i*-8094 Function Reference

(Version 1.0)



**ICP DAS CO., LTD.**

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# Introduction

This software package is dedicated to i-8094 pulse-based motion controller. It includes the driver and ANSI-C Library for WinPAC and XPAC\_CE (XPAC Compact Edition).

The slot number that the module installed on will be referred by each function in Library. This slot number helps to identify multiple i-8094 modules in WinPAC / XPAC\_CE.

There are samples that are provided for Microsoft® Visual Studio 2005 C++ and Embedded Visual C++ to demonstrate the functions of i-8094 Library. Some samples need the Generic-Type terminal-board (DN-8468G) to connect the external sensors, output pulse and encoder-input.

This documentation provides the detailed information of i-8094 APIs, including the function-decelerations, definitions of both parameters and return codes. The APIs will be cataloged and described in the following chapters:

- CHAPTER 2 – System Initialization
- CHAPTER 3 – Automatic Home Search
- CHAPTER 4 – Independent Moving Functions
- CHAPTER 5 – Interpolation Moving Functions
- CHAPTER 6 – Other Motion Functions
- CHAPTER 7 – Advanced Motion Configurations
- CHAPTER 8 – Miscellaneous Functions
- CHAPTER 9 – Status
- CHAPTER 10 – FRnet I/O extension

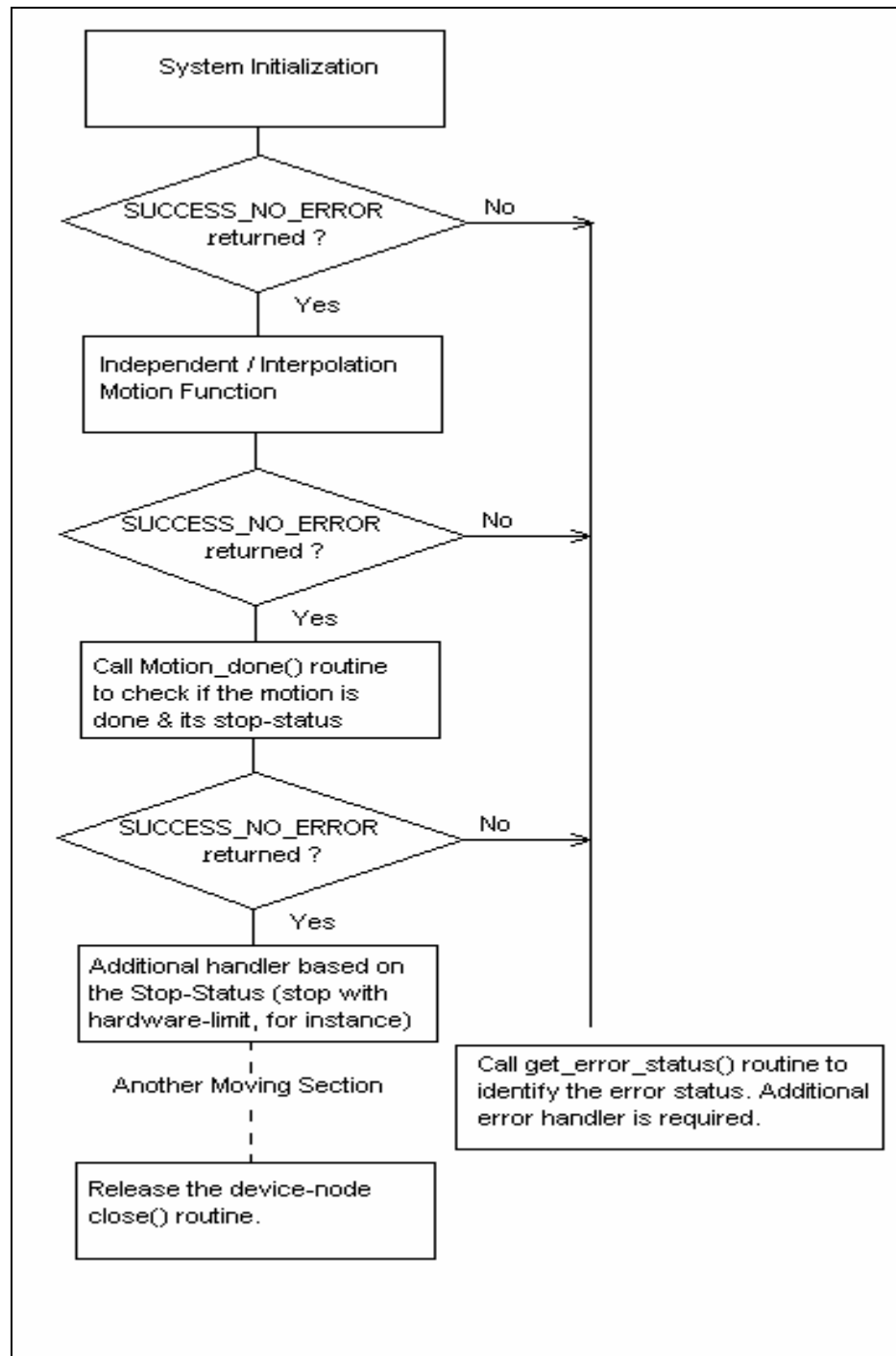


Figure 1 - typical programming following-chart

# System Initialization

## 2.1 Operating-System Configuration

The functions in this chapter provide the interface to WinPAC / XPAC\_CE. By calling these functions, your applications can scan all active i-8094 modules in your PAC, and get the specific slot-number. Open the module and access the internal Motion-Control ASIC with the other functions in i-8094 Library.

### 2.1.1 i8094\_scan

short i8094\_scan(short\* pModuleNum, BYTE\* pAvailModules = NULL)

**Description:**

This function scans all active i-8094 modules in your WinPAC / XPAC\_CE. The pModuleNum saves the numbers of active i-8094 modules. The optional user-provided Array, pAvailModules, indicates the presence of active i-8094 module. (1: present, 0: absent)

**Parameters:**

pModuleNum: The pointer to the memory that stores the numbers of active i-8094 modules.

pAvailModules: The address of user-provided **BYTE**-Array. Based on the slot-number, each element indicates the presence of active i-8094 module. The user must prepare one **BYTE**-Array with **I8094\_MaxModules** elements.

For instance, there are three active i-8094 modules with slot-number 3, 5 and 7. The content of pAvailModules Array will be  
{ 0, 0, 0, 1, 0, 1, 0, 1 }



**Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_NO\_MODULE\_FOUND: There is no active module available in your PAC.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

## 2.1.2 i8094\_get\_cardinfo

```
short i8094_get_cardinfo(int ScannedIndex, BYTE* pSlotNum, WORD* pModuleID = NULL)
```

### **Description:**

This function returns the slot-number based on the scanned-index. This routine will get the slot number that i-8094 module is installed on.

### **Parameters:**

ScannedIndex: The index that the active i-8094 module is scanned. This index begins from 0, and is less than the active i-8094 modules.

pSlotNum: The pointer to the memory that stores the specific slot-number.

pModuleID: The pointer to the memory that stores the module-ID. This parameter is optional.

### **Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_NO\_MODULE\_FOUND: There is no active module available in your system.

ERROR\_INVALID\_SCANNED\_INDEX: Indicates the ScannedIndex is not less than the numbers of active I-8094 modules.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

## 2.1.3 i8094\_open

short i8094\_open(BYTE bSlotNum)

### Description:

This function opens the device node of i-8094 based on the specific slot-number. If this function returns successfully, the process that calls this function owns the device until i8094\_close() is called. The device node of i-8094 is ought to be owned before accessing the Motion-Control ASIC with the other functions. It's recommended to call i8094\_scan() and i8094\_get\_cardinfo() to get the slot-number.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_IOCTL\_FAILED: Cannot get the settings of **Range** register, please call GetLastError() for further system information.

ERROR\_DEVICE\_OPEN: Fail to open the device-node of i-8094. Please make sure no other process owns that i-8094 module.

## 2.1.4 i8094\_close

short i8094\_close(BYTE bSlotNum)

### **Description:**

This function closes the device node of i-8094 based on the specific slot-number. After calling this function, i-8094 module will be released, and other process can open it.

### **Parameters:**

bSlotNum: The specific slot number that i-8094 installed on.

### **Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_DEVICE\_CLOSE: Fail to close the device-node of i-8094.

## 2.1.5 i8094\_reset

short i8094\_reset(BYTE bSlotNum)

### **Description:**

This function re-sets the internal Motion-Control ASIC and re-configures the basic registers with default value. After calling this function, all configuration set before will be ignored. This function terminates the current motion, too.

### **Parameters:**

bSlotNum: The specific slot number that i-8094 installed on.

### **Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MODULE\_RESET: Cannot reset the Motion-Control ASIC, please call GetLastError() for further system information.

## 2.1.6 i8094\_open\_all

short i8094\_open\_all(void)

### Description:

This function opens the all active i-8094 modules. If this function returns successfully, the process that calls this function owns all devices until i8094\_close\_all() is called.

### Parameters:

None

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_IOCTL\_FAILED: Cannot get the settings of **Range** register, please call GetLastError() for further system information.

ERROR\_DEVICE\_OPEN: Fail to open the device-node of i-8094. Please make sure no other process occupies that i-8094 module.

## 2.1.7 i8094\_close\_all

short i8094\_close\_all(void)

### **Description:**

This function closes all i-8094 modules that are opened by one application. After calling this function, the i-8094 modules will be released, and other process can open them.

### **Parameters:**

None

### **Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_DEVICE\_CLOSE: Fail to close the device-node of i-8094.

## 2.1.8 i8094\_reset\_all

short i8094\_reset\_all(void)

### **Description:**

This function re-sets the internal Motion-Control ASIC of all i-8094 modules that are opened by one application, and re-configures the basic registers with default value. After calling this function, all configuration set before will be ignored. This function terminates the current motion of the active i-8094 modules, too.

### **Parameters:**

None

### **Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_MODULE\_RESET: Cannot reset the Motion-Control ASIC, please call GetLastError() for further system information.



## 2.2 Hardware Configuration

After the i-8094 module is activated, the pre-defined configurations are assigned to the relative registers of Motion-Control ASIC. The functions in this chapter configure/change the default-settings and polarities of output-pulse, input-encoder and hardware-limit sensors.

### 2.2.1 i8094\_set\_pls\_cfg

short i8094\_set\_pls\_cfg(BYTE bSlotNum, WORD wAxis, WORD wPulseMode, WORD wPulseLogic, WORD wDirectionLogic)

#### Description:

This function configures the output-pulse mode of i-8094.

#### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wPulseMode: PULSE\_MODE\_CW\_CCW or PULSE\_MODE\_PULSE\_DIRECTION.

wPulseLogic: PULSE\_LOGIC\_ACTIVE\_HIGH or PULSE\_LOGIC\_ACTIVE\_LOW

wDirectionLogic: PULSE\_FORWARD\_ACTIVE\_HIGH or PULSE\_FORWARD\_ACTIVE\_LOW. This parameter will be ignored if the parameter **wPulseMode** is assigned to PULSE\_MODE\_CW\_CCW.

#### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_PULSE\_MODE: Neither PULSE\_MODE\_CW\_CCW nor PULSE\_MODE\_PULSE\_DIRECTION is assigned to parameter **wPulseMode**.

ERROR\_INVALID\_PULSE\_LEVEL: Neither PULSE\_LOGIC\_ACTIVE\_HIGH nor PULSE\_LOGIC\_ACTIVE\_LOW is assigned to parameter **wPulseLogic**.

ERROR\_INVALID\_PULSE\_DIRECTION: Neither PULSE\_FORWARD\_ACTIVE\_HIGH nor PULSE\_FORWARD\_ACTIVE\_LOW is assigned to parameter **wDirectionLogic**.

ERROR\_PULSE\_MODE\_SET: Cannot change the output pulse mode, please call GetLastError() for further system information.

## 2.2.2 i8094\_set\_enc\_cfg

short i8094\_set\_enc\_cfg(BYTE bSlotNum, WORD wAxis, WORD wEncoderMode, BYTE bCounterSource = 0)

### Description:

This function configures the input-encoder mode of i-8094.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wEncoderMode: ENCODER\_MODE\_AB, ENCODER\_MODE\_AB\_DIVID\_2,  
ENCODER\_MODE\_AB\_DIVID\_4 or ENCODER\_MODE\_CW\_CCW.

bCounterSource: The optional parameter that is reserved for future.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_ENCODER\_MODE: No valid encoder mode is assigned to parameter **wEncoderMode**.

ERROR\_ENCODER\_MODE\_SET: Cannot change the input encoder mode, please call GetLastError() for further system information.

## 2.2.3 i8094\_set\_limit

short i8094\_set\_limit(BYTE bSlotNum, WORD wAxis, WORD wLimitLogic, WORD wStopMode = LIMIT\_STOP\_SUDDEN)

### Description:

This function configures the polarity and stop-mode of hardware-limit sensor.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wLimitLogic: LIMIT\_LOGIC\_ACTIVE\_HIGH or LIMIT\_LOGIC\_ACTIVE\_LOW.

wStopMode: LIMIT\_STOP\_SUDDEN or LIMIT\_STOP\_SLOWDOWN. This optional parameter is set as LIMIT\_STOP\_SUDDEN by default.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_LIMIT\_LOGIC: Neither LIMIT\_LOGIC\_ACTIVE\_HIGH nor LIMIT\_LOGIC\_ACTIVE\_LOW is assigned to parameter **wLimitLogic**.

ERROR\_INVALID\_STOP\_MODE: Neither LIMIT\_STOP\_SUDDEN nor LIMIT\_STOP\_SLOWDOWN is assigned to parameter **wStopMode**.

ERROR\_LIMIT\_SENSOR\_SET: Cannot configure the hardware-limit sensor, please call GetLastError() for further system information.

## 2.3 Hardware Configuration (optional)

The functions in this chapter enable/disable the additional signals, including INP and ALARM. The signal-filtering feature is built in Motion-Control ASIC, and can be configured with `i8094_set_filter()`.

The **Range** register of Motion-Control ASIC can be configured with `i8094_set_range()` function.

Assigning different value to the **Range** register, the accuracy and valid-range of speed, acceleration/deceleration and jerk/deceleration-rate will be changed.

The Motion-Control ASIC also provides the software-limit feature, and is enabled/configured with `i8094_set_softlimit()`. Another helpful function, `i8094_load_config()`, configures all i-8094 modules with the pre-defined configuration file, `I8094_Config.bin`.

### 2.3.1 i8094\_set\_range

short `i8094_set_range(BYTE bSlotNum, WORD wAxis, DWORD dwRange)`

#### Description:

This function changes the **Range** register to change the accuracy and valid-range of speed, acceleration/deceleration and jerk/deceleration-rate. The relationship between **Range** register and Speed/Acceleration/Jerk is illustrated in Figure 2. Another function, `i8094_get_range_settings()`, gets the current valid-range of speed, acceleration/deceleration and jerk/deceleration-rate.

$\text{Multiple} = \frac{8,000,000}{R}$	$\text{Deceleration Increasing Rate (PPS/SEC}^2) = \frac{62.5 \times 10^6}{L} \times \underbrace{\frac{8,000,000}{R}}_{\text{Multiple}}$
$\text{Jerk (PPS/SEC}^3) = \frac{62.5 \times 10^6}{K} \times \underbrace{\frac{8,000,000}{R}}_{\text{Multiple}}$	$\text{Deceleration (PPS/SEC)} = D \times 125 \times \underbrace{\frac{8,000,000}{R}}_{\text{Multiple}}$
$\text{Acceleration (PPS/SEC)} = A \times 125 \times \underbrace{\frac{8,000,000}{R}}_{\text{Multiple}}$	$\text{Initial Speed (PPS)} = SV \times \underbrace{\frac{8,000,000}{R}}_{\text{Multiple}}$
$\text{Drive Speed (PPS)} = V \times \underbrace{\frac{8,000,000}{R}}_{\text{Multiple}}$	

Figure 2 – relationship between **Range** register and Speed/Acceleration/Jerk

#### Parameters:

`bSlotNum`: The specific slot number that i-8094 installed on.

`wAxis`: Can be one of `AXIS_X`, `AXIS_Y`, `AXIS_Z` or `AXIS_U`.

dwRange: The value to be assigned to the **Range** register (16,000 ~ 8,000,000)

**Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_RANGE: The value to be assigned to **Range** register is invalid.

ERROR\_RANGE\_CHANGE: Cannot change the content of **Range** register, please call GetLastError() for further system information.

## 2.3.2 i8094\_get\_range\_settings

short i8094\_get\_range\_settings(BYTE bSlotNum, WORD wAxis, AXIS\_RANGE\_SETTINGS\* pAxisRangeSetting)

### Description:

This function gets the valid-range of Speed, Acceleration/Deceleration and Jerk/Deceleration-Increasing-Rate based on the setting of **Range** register. Please refer to the 'Set\_Range' sample.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pAxisRangeSetting: The pointer to the data structure that stores the valid-range of Speed, Acceleration/Deceleration and Jerk/Deceleration-Increasing-Rate.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

## 2.3.3 i8094\_set\_inp

short i8094\_set\_inp(BYTE bSlotNum, WORD wAxis, WORD wINPEnable, WORD wINPLogic)

### Description:

This function enables/disables INP feature and configures its polarity. This feature is active until calling i8094\_set\_inp() with INP\_DISABLE\_FEATURE.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wINPEnable: INP\_ENABLE\_FEATURE or INP\_DISABLE\_FEATURE.

wINPLogic: INP\_LOGIC\_ACTIVE\_HIGH or INP\_LOGIC\_ACTIVE\_LOW.

### Caveat:

If the incorrect setting is assigned to parameter **wINPLogic**, the i8094\_motion\_done() will report MOTION\_NOT\_DONE always.

It's recommended to run **i8094\_EzGo.exe** to check the correct settings.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_INP\_ENABLE: Neither INP\_ENABLE\_FEATURE nor INP\_DISABLE\_FEATURE is assigned to parameter **wINPEnable**.

ERROR\_INVALID\_INP\_LOGIC\_LEVEL: Neither INP\_LOGIC\_ACTIVE\_HIGH nor INP\_LOGIC\_ACTIVE\_LOW is assigned to parameter **wINPLogic**.

ERROR\_INP\_SIGNAL\_SET: Cannot set the INP configuration, please call GetLastError() for further system information.



## 2.3.4 i8094\_set\_alarm

short i8094\_set\_alarm(BYTE bSlotNum, WORD wAxis, WORD wAlarmEnable, WORD wAlarmLogic)

### Description:

This function enables/disables ALARM feature and configures its polarity. This feature is active until calling i8094\_set\_alarm() with ALARM\_DISABLE\_FEATURE.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wAlarmEnable: ALARM\_ENABLE\_FEATURE or ALARM\_DISABLE\_FEATURE.

wAlarmLogic: ALARM\_LOGIC\_ACTIVE\_HIGH or ALARM\_LOGIC\_ACTIVE\_LOW.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_ALARM\_ENABLE: Neither ALARM\_ENABLE\_FEATURE nor ALARM\_DISABLE\_FEATURE is assigned to parameter **wAlarmEnable**.

ERROR\_INVALID\_ALARM\_LOGIC\_LEVEL: Neither ALARM\_LOGIC\_ACTIVE\_HIGH nor ALARM\_LOGIC\_ACTIVE\_LOW is assigned to parameter **wAlarmLogic**.

ERROR\_ALARM\_SIGNAL\_SET: Cannot set the ALARM configuration, please call GetLastError() for further system information.

## 2.3.5 i8094\_set\_filter

short i8094\_set\_filter(BYTE bSlotNum, WORD wAxis, WORD wFilterEnable, WORD wFilterCfg, WORD wDelayTime)

### Description:

This function enables/disables the signal filter built in Motion-Control ASIC, and configures the signal-sources and delay-time. This feature is active until calling i8094\_set\_filter() with FILTER\_DISABLE\_FEATURE.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wFilterEnable: FILTER\_ENABLE\_FEATURE or FILTER\_DISABLE\_FEATURE.

wFilterCfg: The following signal-sources can be combined with OR ( | ) operator.

FILTER\_CFG\_EMG\_EL\_ORG\_NORG (for EMG, hardware-limit, Home and Near-Home),

FILTER\_CFG\_ENCODER\_Z\_PHASE (for Z-Phase/INDEX),

FILTER\_CFG\_INP\_ALARM (for INP and ALARM),

FILTER\_CFG\_EXP\_EXPLSN (for manual-pulse-generator),

FILTER\_CFG\_IN3 (for digital-input IN3)

wDelayTime: Can be one of the following delay-time settings (unit: micro-second):

FILTER\_DELAY\_2us,

FILTER\_DELAY\_256us,

FILTER\_DELAY\_512us,

FILTER\_DELAY\_1024us,

FILTER\_DELAY\_2048us,

FILTER\_DELAY\_4096us,

FILTER\_DELAY\_8192us,

FILTER\_DELAY\_16384us

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_FILTER\_ENABLE: Neither FILTER\_ENABLE\_FEATURE nor

FILTER\_DISABLE\_FEATURE is assigned to parameter **wFilterEnable**.

ERROR\_INVALID\_FILTER\_CONFIGURATION: Invalid Filter-Source combination is assigned to

parameter **wFilterCfg**.

ERROR\_INVALID\_FILTER\_DELAY\_TIME: Invalid delay-time is assigned to parameter **wDelayTime**.

ERROR\_FILTER\_SET: Cannot set the Filter configuration, please call GetLastError() for further system information.

## 2.3.6 i8094\_set\_softlimit

short i8094\_set\_softlimit(BYTE bSlotNum, WORD wAxis, WORD wSWLimitEnable, WORD wCmpSource, long LimitPositive, long LimitNegative)

### Description:

The internal comparators of Motion-Control ASIC provide the software-limit feature. The Motion-Control ASIC will monitor either Logic-Command counter or Encoder-Position counter. Once the content of these counters exceeds the pre-defined value, the deceleration stop will be started. This feature is active until calling i8094\_set\_softlimit() with SW\_LIMIT\_DISABLE\_FEATURE.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wSWLimitEnable: SW\_LIMIT\_ENABLE\_FEATURE or SW\_LIMIT\_DISABLE\_FEATURE.

wCmpSource: CMP\_SRC\_LOGIC\_COMMAND or CMP\_SRC\_ENCODER\_POSITION.

LimitPositive: The pre-defined value for the comparator in forward direction.

LimitNegative: The pre-defined value for the comparator in reverse direction.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_SOFTWARE\_LIMIT\_ENABLE: Neither SW\_LIMIT\_ENABLE\_FEATURE nor SW\_LIMIT\_DISABLE\_FEATURE is assigned to parameter **wSWLimitEnable**.

ERROR\_INVALID\_SOFTWARE\_LIMIT\_COMPARATOR\_SOURCE: Neither CMP\_SRC\_LOGIC\_COMMAND nor CMP\_SRC\_ENCODER\_POSITION is assigned to parameter **wCmpSource**.

ERROR\_CONFLICT\_WITH\_VRING: Indicates that the ASIC-Internal Comparators are used for Variable-Ring counter. Please disable Variable-Ring counter with i8094\_set\_vring().

ERROR\_CONFLICT\_WITH\_SYNCH\_ACTION: Indicates that the ASIC-Internal Comparators are used as the condition of Synchronous-Action. Please disable synchronous-condition with i8094\_set\_synch().

ERROR\_SW\_LIMIT\_SET: Cannot configure the software-limit settings, please call GetLastError() for further system information.



## 2.3.7 i8094\_load\_config

short i8094\_load\_config(char\* FileName = NULL)

### Description:

This function loads the pre-defined configuration file and configures all active -8094 modules automatically. The i8094\_open\_all() is needed to be called before this function.

It's strongly recommended to change the settings of configuration file with the utility, i8094\_EzGO.exe.

The involved configuration routines are:

i8094\_set\_pls\_cfg(), i8094\_set\_enc\_cfg(), i8094\_set\_limit(), i8094\_set\_home\_cfg(), i8094\_set\_softlimit(), i8094\_set\_alarm(), i8094\_set\_inp() and i8094\_set\_filter().

### Parameters:

FileName: The pointer to the memory that stores the pathname of configuration file. Without assigning pathname, the default configuration file, \System\_Disk\ICPDAS\System\i8094\_Config.bin, will be loaded. This parameter is optional, and NULL is assigned by default.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_CONFIG\_FILE\_LOAD: Cannot locate the configuration file.

ERROR\_CONFLICT\_IN\_CONFIG\_FILE: The active i-8094 modules settings is not identical to the configuration file.

ERROR\_INVALID\_FILE\_HANDLE: There is no valid file-handle is related to the i-8094 module recorded in configuration. Please make sure the i8094\_open\_all() had been called and returns SUCCESS\_NO\_ERROR..

Other return codes please refer to the following functions:

i8094\_set\_pls\_cfg, i8094\_set\_enc\_cfg, i8094\_set\_limit, i8094\_set\_softlimit, i8094\_set\_inp, i8094\_set\_alarm and i8094\_set\_filter.

## 2.3.8 i8094\_servo\_on

short i8094\_servo\_on(BYTE bSlotNum, WORD wAxis, BYTE bServoON, BYTE bAutoOFF)

### Description:

This function turns on/off the Servo.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

bServoON: SERVO\_ON or SERVO\_OFF.

bAutoOFF: SERVO\_MANUAL\_OFF: turn off Servo manually.

SERVO\_AUTO\_OFF: turn off Servo when the i8094\_close() or i8094\_close\_all() is called.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_SERVO\_SETTING: Neither SERVO\_ON nor SERVO\_OFF is assigned to parameter **bServoON**.

ERROR\_SERVO\_ON\_SET: Cannot set the Servo output, please call GetLastError() for further system information.

## Automatic Home Search

With the external Near-Home (NORG), Home (ORG) and Z-Phase/INDEX sensors, the auto-homing feature provided by Motion-Control ASIC will help to search the Home (ORG) automatically.

The typical Automatic Home Search is illustrated in Figure 3.

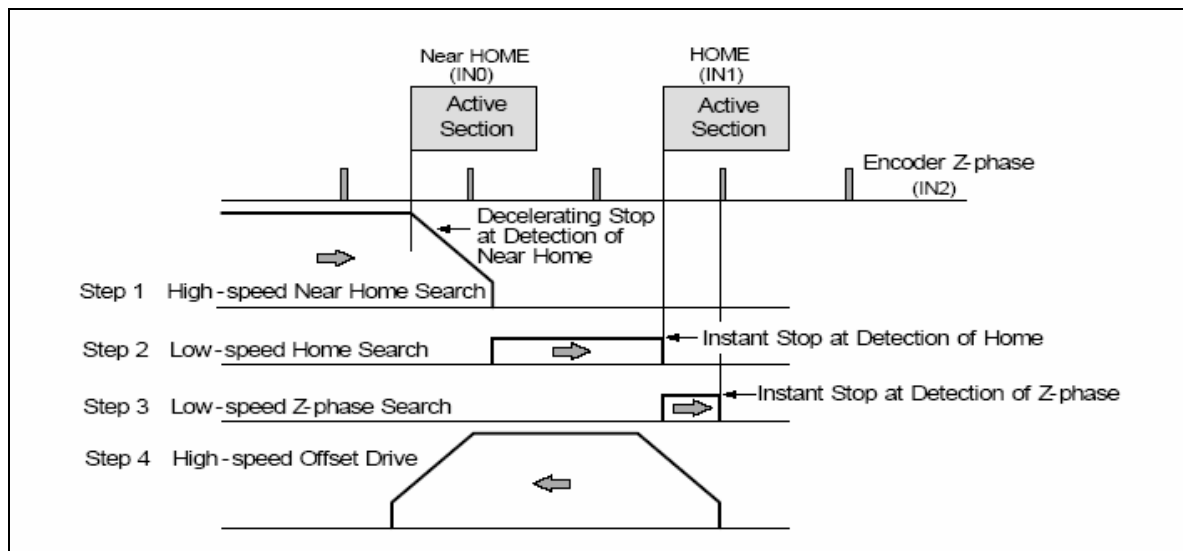


Figure 3 - typical Automatic Home Search



## 3.1 i8094\_set\_home\_cfg

short i8094\_set\_home\_cfg(BYTE bSlotNum, WORD wAxis, WORD wHomeLogic, WORD wNHomeLogic, WORD wIndexLogic, WORD wHomeSteps, DWORD dwStep4Offset)

### Description:

This function configures the polarities of Near-Home(NORG), Home(ORG) and Z-Phase/INDEX sensors. The searching-steps of Automatic-Home-Search are configured in this function, too.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wHomeLogic: HOME\_LOGIC\_ACTIVE\_HIGH or HOME\_LOGIC\_ACTIVE\_LOW.

wNHomeLogic: NHOME\_LOGIC\_ACTIVE\_HIGH or NHOME\_LOGIC\_ACTIVE\_LOW

wIndexLogic: INDEX\_LOGIC\_ACTIVE\_HIGH or INDEX\_LOGIC\_ACTIVE\_LOW

wHomeSteps: The combination of Automatic-Home-Search 4-Steps. The configurations are:

Step-1:

AUTO\_HOME\_STEP1\_FORWARD, AUTO\_HOME\_STEP1\_REVERSE and  
AUTO\_HOME\_STEP1\_DISABLE

Step-2:

AUTO\_HOME\_STEP2\_FORWARD, AUTO\_HOME\_STEP2\_REVERSE and  
AUTO\_HOME\_STEP2\_DISABLE

Step-3:

AUTO\_HOME\_STEP3\_FORWARD, AUTO\_HOME\_STEP3\_REVERSE and  
AUTO\_HOME\_STEP3\_DISABLE

Step-4:

AUTO\_HOME\_STEP4\_FORWARD, AUTO\_HOME\_STEP4\_REVERSE and  
AUTO\_HOME\_STEP4\_DISABLE

**Notice:** Based on external sensor, It's recommended to include either

AUTO\_HOME\_STEP1\_FORWARD/AUTO\_HOME\_STEP1\_REVERSE or

AUTO\_HOME\_STEP2\_FORWARD/AUTO\_HOME\_STEP2\_REVERSE in wHomeSteps.

dwStep4Offset: The offset driving in Step-4 of Automatic Home Search.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_HOME\_LOGIC\_LEVEL: Neither HOME\_LOGIC\_ACTIVE\_HIGH nor HOME\_LOGIC\_ACTIVE\_LOW is assigned to parameter **wHomeLogic**.

ERROR\_INVALID\_NEAR\_HOME\_LOGIC\_LEVEL: Neither NHOME\_LOGIC\_ACTIVE\_HIGH nor NHOME\_LOGIC\_ACTIVE\_LOW is assigned to parameter **wNHomeLogic**.

ERROR\_INVALID\_INDEX\_LOGIC\_LEVEL: Neither INDEX\_LOGIC\_ACTIVE\_HIGH nor INDEX\_LOGIC\_ACTIVE\_LOW is assigned to parameter **wIndexLogic**.

ERROR\_INVALID\_AUTO\_HOME\_STEP: The Automatic-Home-Search Steps are out of pre-defined configurations.

ERROR\_HOME\_CFG\_SET: Cannot change the configuration of Automatic-Home-Search, please call GetLastError() for further system information.

## 3.2 i8094\_home\_start

short i8094\_home\_start(BYTE bSlotNum, WORD wAxis, DWORD dwStartSpeed, DWORD dwAcceleration, DWORD dwDeceleration, DWORD dwNHomeSearchSpeed, DWORD dwHomeSearchSpeed, WORD wBlockMode = DISABLE\_BLOCK\_OPEARTION)

### Description:

This function starts Automatic-Home-Search with the Start-Speed, Acceleration/Deceleration, Near-Home Searching Speed and Home Searching Speed.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwStartSpeed: The Start Speed in Step-1 of Automatic-Home-Search.

dwAcceleration: The Acceleration in Step-1 of Automatic-Home-Search motion.

dwDeceleration: The Deceleration in Step-1 of Automatic-Home-Search motion.

dwNHomeSearchSpeed: The Near-Home Search Speed(Driving Speed) in Step-1 of Automatic-Home-Search motion.

dwHomeSearchSpeed: The Home Search Speed in Step-2 of Automatic-Home-Search motion. This speed is recommended to be lower than dwStartSpeed.

wBlockMode: The Block/Non-Block operation mode. Now only DISABLE\_BLOCK\_OPEARTION is valid.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_BLOCK\_OPEARTION\_MODE: Not DISABLE\_BLOCK\_OPEARTION is assigned to parameter **wBlockMode**.

ERROR\_INVALID\_HOME\_SEARCH\_SPEED: The value assigned to parameter **dwHomeSearchSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than **dwNHomeSearchSpeed**.

**ERROR\_INVALID\_START\_SPEED:** The value assigned to parameter ***dwStartSpeed*** is out of range of Speed. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**ERROR\_INVALID\_DRIVING\_SPEED:** The value assigned to parameter ***dwNHomeSearchSpeed*** is out of range of Speed. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**ERROR\_INVALID\_ACCELERATION:** The value assigned to parameter ***dwAcceleration*** is out of range of Acceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**ERROR\_INVALID\_DECELERATION:** The value assigned to parameter ***dwDeceleration*** is out of range of Deceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**ERROR\_CONFIG\_IS\_NEEDED:** The Automatic-Home-Search had not been configured. Please configure the Automatic-Home-Search with `i8094_set_home_cfg()` first.

**ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z, ERROR\_OCCURS\_IN\_AXIS\_U:**  
Indicates that some error happens to `AXIS_X`, `AXIS_Y`, `AXIS_Z` or `AXIS_U`. Please call `i8094_get_error_status()` for detailed information.

**ERROR\_MOTION\_NOT\_COMPLETE:** Indicates the previous motion is not completed. Please wait for completion of motion, or stop motion with `i8094_stop_move()`.

**ERROR\_CONFLICT\_WITH\_MPG:** Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with `i8094_set_mpg()`.

**ERROR\_START\_HOME:** Cannot start Automatic-Home-Search, please call `GetLastError()` for further system information.

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# Independent Moving Functions

These functions in this chapter start the independent motion, including velocity-move, constant-speed move, trapezoidal-profile and S-curve move.

## 4.1 i8094\_velocity\_move

short i8094\_velocity\_move(BYTE bSlotNum, WORD wAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAcceleration, BYTE bDirection)

### Description:

This function starts velocity-move with **dwDriveSpeed** driving-speed continuously. The trapezoidal-profile moving will be applied to Acceleration. Calling i8094\_stop\_move() to terminate the velocity-move.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwStartSpeed: The Start-Speed in trapezoidal-profile move.

dwDriveSpeed: The Drive-Speed in trapezoidal-profile move.

dwAcceleration: The Acceleration in trapezoidal-profile move.

bDirection: MOVE\_DIRECTION\_FORWARD or MOVE\_DIRECTION\_REVERSE.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_MOVE\_DIRECTION: Neither MOVE\_DIRECTION\_FORWARD nor MOVE\_DIRECTION\_REVERSE is assigned to parameter **bDirection**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than **dwDriveSpeed**.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_ACCELERATION: The value assigned to parameter **dwAcceleration** is out of range of Acceleration. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z  
ERROR\_OCCURS\_IN\_AXIS\_U:  
Indicates that some error happens to AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U. Please call i8094\_get\_error\_status() for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with i8094\_set\_mpg().

ERROR\_CONTI\_MOVE\_START: Cannot start velocity-move, please call GetLastError() for further system information.

## 4.2 i8094\_const\_move

short i8094\_const\_move(BYTE bSlotNum, WORD wAxis, DWORD dwDriveSpeed, long FixedPulse)

### Description:

This function starts constant-speed, fixed-pulse motion. No acceleration/deceleration is applied in this motion.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwDriveSpeed: The Drive-Speed in constant-speed moving.

FixedPulse: The total numbers of output pulse. This parameter is a signed 32-bits variable, the negative value indicates motion in reverse-direction

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z

ERROR\_OCCURS\_IN\_AXIS\_U:

Indicates that some error happens to AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U. Please call i8094\_get\_error\_status() for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with i8094\_set\_mpg().

ERROR\_CONST\_MOVE\_START: Cannot start constant-speed motion, please call GetLastError() for further system information.

## 4.3 i8094\_const\_moveall

short i8094\_const\_moveall(BYTE bSlotNum, WORD wAxis, DWORD dwDriveSpeed[], long FixedPulse[])

### Description:

This function starts multiple axes the constant-speed, fixed-pulse moving simultaneously. No acceleration/deceleration is applied in this motion.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxes: Can be any combination of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwDriveSpeed[]: The pointer to the **DWORD**-Array that contains Driving-Speed of multiple axes. Different speed can be assigned to each axis.

FixedPulse[]: The pointer to the **long**-Array that contains Fixed-Pulse of multiple axes. Different pulse number can be assigned to each axis. The element of this **long**-Array is a signed 32-bits variable, the negative value indicates motion in reverse-direction

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to some elements of **dwDriveSpeed[]** are out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,

ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,

ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,

ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,

ERROR\_OCCURS\_IN\_AXIS\_ZU, ERROR\_OCCURS\_IN\_AXIS\_XYZ,

ERROR\_OCCURS\_IN\_AXIS\_XYU, ERROR\_OCCURS\_IN\_AXIS\_XZU,

ERROR\_OCCURS\_IN\_AXIS\_YZU, ERROR\_OCCURS\_IN\_AXIS\_XYZU:

Indicates that some error happens to AXIS\_xxxx. Please call i8094\_get\_error\_status() for detailed information.



ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active.

Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call `GetLastError()` for further system information.

ERROR\_CONST\_MOVE\_START: Cannot start constant-speed motion, please call `GetLastError()` for further system information.

## 4.4 i8094\_t\_move

short i8094\_t\_move(BYTE bSlotNum, WORD wAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAcceleration, DWORD dwDeceleration, long FixedPulse, short wAccCntOffset = 8)

### Description:

This function starts trapezoidal-profile, fixed-pulse motion.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwStartSpeed: The Start-Speed in trapezoidal-profile moving.

dwDriveSpeed: The Drive-Speed in trapezoidal-profile moving.

dwAcceleration: The Acceleration in trapezoidal-profile moving.

dwDeceleration: The Deceleration in trapezoidal-profile moving.

FixedPulse: The total numbers of output pulse. This parameter is a signed 32-bits variable, the negative value indicates motion in reverse-direction

wAccCntOffset: This optional parameter to configure the offset for Acceleration/Deceleration driving. The default setting of **wAccCntOffset** is 8.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than **dwDriveSpeed**.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_ACCELERATION: The value assigned to parameter **dwAcceleration** is out of range of Acceleration. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DECELERATION: The value assigned to parameter ***dwDeceleration*** is out of range of Deceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**Notice:** In the case, ***dwAcceleration*** > ***dwDeceleration*** , the following formula should be satisfied, too.

$$\mathbf{dwDeceleration} > (\mathbf{dwAcceleration} \times \mathbf{dwDriveSpeed}) / 4,000,000.$$

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z  
ERROR\_OCCURS\_IN\_AXIS\_U:

Indicates that some error happens to AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active.  
Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_T\_MOVE\_START: Cannot start trapezoidal moving, please call `GetLastError()` for further system information.

## 4.5 i8094\_t\_moveall

short i8094\_t\_moveall(BYTE bSlotNum, WORD wAxes, DWORD dwStartSpeed[], DWORD dwDriveSpeed[], DWORD dwAcceleration[], DWORD dwDeceleration[], long FixedPulse[], short wAccCntOffset[] = NULL)

### Description:

This function starts multiple axes the trapezoidal-profile, fixed-pulse moving simultaneously.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxes: can be any combination of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwStartSpeed[]: The pointer to the **DWORD**-Array that contains Start-Speed of multiple axes.

Different value can be assigned to each axis.

dwDriveSpeed[]: The pointer to the **DWORD**-Array that contains Driving-Speed of multiple axes.

Different value can be assigned to each axis.

dwAcceleration[]: The pointer to the **DWORD**-Array that contains Acceleration of multiple axes.

Different value can be assigned to each axis.

dwDeceleration[]: The pointer to the **DWORD**-Array that contains Deceleration of multiple axes.

Different value can be assigned to each axis.

FixedPulse[]: The pointer to the **long**-Array that contains Fixed-Pulse of multiple axes. Different pulse number can be assigned to each axis. The element of this parameter is a signed 32-bits variable, the negative value indicates motion in reverse-direction

wAccCntOffset[]: This optional pointer to the **short**-Array that contains offset of multiple axes. The default setting of **wAccCntOffset[]** is NULL.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: Some elements in **dwStartSpeed[]** are larger than relative element of **dwDriveSpeed[]**.

ERROR\_INVALID\_START\_SPEED: The value assigned to some elements of **dwStartSpeed[]** are out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to some elements of ***dwDriveSpeed[]*** are out of range of Speed. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_INVALID\_ACCELERATION: The value assigned to some elements of ***dwAcceleration[]*** are out of range of Acceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_INVALID\_DECELERATION: The value assigned to some elements of ***dwDeceleration[]*** are out of range of Deceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**Notice:** In the case, ***dwAcceleration > dwDeceleration*** , the following formula should be satisfied, too.

$$\mathbf{dwDeceleration > (dwAcceleration \times dwDriveSpeed) / 4,000,000.}$$

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,  
ERROR\_OCCURS\_IN\_AXIS\_ZU, ERROR\_OCCURS\_IN\_AXIS\_XYZ,  
ERROR\_OCCURS\_IN\_AXIS\_XYU, ERROR\_OCCURS\_IN\_AXIS\_XZU,  
ERROR\_OCCURS\_IN\_AXIS\_YZU, ERROR\_OCCURS\_IN\_AXIS\_XYZU:

Indicates that some error happens to AXIS\_xxxx. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call `GetLastError()` for further system information.

ERROR\_T\_MOVE\_START: Cannot start trapezoidal moving, please call `GetLastError()` for further system information.

## 4.6 i8094\_s\_move

short i8094\_t\_move(BYTE bSlotNum, WORD wAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAccelerationRate, DWORD dwDecelerationRate, long FixedPulse, short wAccCntOffset = 8)

### Description:

This function starts S-curve, fixed-pulse motion.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwStartSpeed: The Start-Speed in S-curve moving.

dwDriveSpeed: The Drive-Speed in S-curve moving.

dwAccelerationRate: The Acceleration-Increasing-Rate in S-curve moving. The Acceleration will be assigned to maximum value automatically.

dwDecelerationRate: The Deceleration-Increasing-Rate in S-curve moving. The Deceleration will be assigned to maximum value automatically.

FixedPulse: This parameter is a signed 32-bits variable, the negative value indicates motion in reverse-direction

wAccCntOffset: This optional parameter to configure the offset for Acceleration/Deceleration driving. The default setting of **wAccCntOffset** is 8.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than or equal to **dwDriveSpeed**.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_JERK: The value assigned to parameter **dwAccelerationRate** is out of range of Acceleration-Increasing-Rate. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_INVALID\_DECELERATION\_RATE: The value assigned to parameter **dwDecelerationRate** is out of range of Deceleration-Increasing-Rate. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z  
ERROR\_OCCURS\_IN\_AXIS\_U:

Indicates that some error happens to AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_S\_MOVE\_START: Cannot start S-curve moving, please call `GetLastError()` for further system information.

## 4.7 i8094\_s\_moveall

short i8094\_s\_moveall(BYTE bSlotNum, WORD wAxes, DWORD dwStartSpeed[], DWORD dwDriveSpeed[], DWORD dwAccelerationRate[], DWORD dwDecelerationRate[], long FixedPulse[], short wAccCntOffset[] = NULL)

### Description:

This function starts multiple axes the S-curve, fixed-pulse moving simultaneously.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxes: Can be any combination of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwStartSpeed[]: The pointer to the **DWORD**-Array that contains Start-Speed of multiple axes.

Different value can be assigned to each axis.

dwDriveSpeed[]: The pointer to the **DWORD**-Array that contains Driving-Speed of multiple axes.

Different value can be assigned to each axis.

dwAccelerationRate[]: The pointer to the **DWORD**-Array that contains Acceleration-Increasing-Rate of multiple axes. Different value can be assigned to each axis.

dwDecelerationRate[]: The pointer to the **DWORD**-Array that contains Deceleration-Increasing-Rate of multiple axes. Different value can be assigned to each axis.

FixedPulse[]: The pointer to the **long**-Array that contains Fixed-Pulse of multiple axes. Different pulse number can be assigned to each axis. The element of this parameter is a signed 32-bits variable, the negative value indicates motion in reverse-direction

wAccCntOffset[]: This optional pointer to the **short**-Array that contains offset of multiple axes. The default setting of **wAccCntOffset[]** is NULL.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: Some elements in **dwStartSpeed[]** are larger than relative element of **dwDriveSpeed[]**.

ERROR\_INVALID\_START\_SPEED: The value assigned to some elements of **dwStartSpeed[]** are out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().



ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to some elements of ***dwDriveSpeed[]*** are out of range of Speed. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_INVALID\_JERK: The value assigned to some elements of ***dwAccelerationRate[]*** are out of range of Acceleration-Increasing-Rate. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_INVALID\_DECELERATION\_RATE: The value assigned to some elements of ***dwDecelerationRate[]*** are out of range of Deceleration-Increasing-Rate. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,  
ERROR\_OCCURS\_IN\_AXIS\_ZU, ERROR\_OCCURS\_IN\_AXIS\_XYZ,  
ERROR\_OCCURS\_IN\_AXIS\_XYU, ERROR\_OCCURS\_IN\_AXIS\_XZU,  
ERROR\_OCCURS\_IN\_AXIS\_YZU, ERROR\_OCCURS\_IN\_AXIS\_XYZU:

Indicates that some error happens to AXIS\_xxxx. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call `GetLastError()` for further system information.

ERROR\_S\_MOVE\_START: Cannot start S-curve moving, please call `GetLastError()` for further system information.

# Interpolation Moving Functions

## 5.1 Individual Interpolation Moving

The functions in this chapter provide both trapezoidal and S-curve acceleration/deceleration in 2D/3D linear interpolation moving. And only trapezoidal acceleration/deceleration can be applied to circular interpolation moving.

### 5.1.1 i8094\_t\_line2\_move

```
short i8094_t_line2_move(BYTE bSlotNum, WORD wMainAxis, WORD wSlaveAxis, DWORD  
dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAcceleration, DWORD dwDeceleration, long  
MainAxisFinishPoint, long SlaveAxisFinishPoint, short wAccCntOffset = 8, WORD wBlockMode =  
DISABLE_BLOCK_OPEARTION)
```

**Description:**

This function starts the trapezoidal-profile, 2-dimension linear interpolation moving.

**Parameters:**

bSlotNum: The specific slot number that i-8094 installed on.

wMainAxis: The main-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or  
AXIS\_U.

wSlaveAxis: The slave-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or  
AXIS\_U (cannot be the same as **wMainAxis**).

dwStartSpeed: The Start-Speed in trapezoidal-profile moving. This Start-Speed will be applied to  
main-axis.

dwDriveSpeed: The Drive-Speed in trapezoidal-profile moving. This Drive-Speed will be applied to  
main-axis.

dwAcceleration: The Acceleration in trapezoidal-profile moving. This Acceleration will be applied to  
main-axis.

**dwDeceleration:** The Deceleration in trapezoidal-profile moving. This Deceleration will be applied to main-axis.

**MainAxisFinishPoint:** The finish point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

**SlaveAxisFinishPoint:** The finish point of slave-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

**wAccCntOffset:** This optional parameter to configure the offset for Acceleration/Deceleration driving. The default setting of **wAccCntOffset** is 8.

**wBlockMode:** The Block/Non-Block operation mode. Now only DISABLE\_BLOCK\_OPEARTION is valid.

#### **Return Code:**

**SUCCESS\_NO\_ERROR:** The function returns successfully.

**ERROR\_INVALID\_CARD\_ID:** There is no active i-8094 module on the given slot, **bSlotNum**; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

**ERROR\_MULTI\_AXES\_ASSIGNED:** Multiple axes are assigned to parameter **wMainAxis** or **wSlaveAxis**.

**ERROR\_NO\_VALID\_AXIS\_ASSIGNED:** No valid axis ID is assigned to parameter **wMainAxis** or **wSlaveAxis**.

**ERROR\_INVALID\_INTERPOLATION\_SLAVE\_AXES:** The parameter **wSlaveAxis** includes the axis ID assigned to **wMainAxis**.

**ERROR\_INVALID\_BLOCK\_OPEARTION\_MODE:** Not DISABLE\_BLOCK\_OPEARTION is assigned to parameter **wBlockMode**.

**ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED:** The **dwStartSpeed** is larger than **dwDriveSpeed**.

**ERROR\_INVALID\_START\_SPEED:** The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**ERROR\_INVALID\_DRIVING\_SPEED:** The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**ERROR\_INVALID\_ACCELERATION:** The value assigned to parameter **dwAcceleration** is out of range of Acceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**ERROR\_INVALID\_DECELERATION:** The value assigned to parameter **dwDeceleration** is out of range of Deceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**Notice:** In the case, *dwAcceleration* > *dwDeceleration* , the following formula should be satisfied, too.

$$\mathbf{dwDeceleration} > (\mathbf{dwAcceleration} \times \mathbf{dwDriveSpeed}) / 4,000,000.$$

ERROR\_INTERPOLATION\_NOT\_COMPLETE: The interpolation moving started before had not completed.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,  
ERROR\_OCCURS\_IN\_AXIS\_ZU:

Indicates that some error happens to AXIS\_xxxx. Please call `i8094_get_error_status()` for detailed information.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call `GetLastError()` for further system information.

ERROR\_T\_LINE2\_START: Cannot start trapezoidal 2D interpolation moving, please call `GetLastError()` for further system information.

## 5.1.2 i8094\_s\_line2\_move

short i8094\_s\_line2\_move(BYTE bSlotNum, WORD wMainAxis, WORD wSlaveAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAccelerationRate, DWORD dwDecelerationRate, long MainAxisFinishPoint, long SlaveAxisFinishPoint, short wAccCntOffset = 8, WORD wBlockMode = DISABLE\_BLOCK\_OPEARTION)

### Description:

This function starts the S-curve, 2-dimension linear interpolation moving.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wMainAxis: The main-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wSlaveAxis: The slave-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U (cannot be the same as **wMainAxis**).

dwStartSpeed: The Start-Speed in S-curve moving. This Start-Speed will be applied to main-axis.

dwDriveSpeed: The Drive-Speed in S-curve moving. This Drive-Speed will be applied to main-axis.

dwAccelerationRate: The Acceleration-Increasing-Rate in S-curve moving. The Acceleration will be assigned to maximum value automatically. This Acceleration-Increasing-Rate will be applied to main-axis.

dwDecelerationRate: The Deceleration-Increasing-Rate in S-curve moving. The Deceleration will be assigned to maximum value automatically. This Acceleration-Increasing-Rate will be applied to main-axis.

MainAxisFinishPoint: The finish point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

SlaveAxisFinishPoint: The finish point of slave-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction

wAccCntOffset: This optional parameter to configure the offset for Acceleration/Deceleration driving. The default setting of **wAccCntOffset** is 8.

wBlockMode: The Block/Non-Block operation mode. Now only DISABLE\_BLOCK\_OPEARTION is valid.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wMainAxis** or **wSlaveAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wMainAxis** or **wSlaveAxis**.

ERROR\_INVALID\_INTERPOLATION\_SLAVE\_AXES: The parameter **wSlaveAxis** includes the axis ID assigned to **wMainAxis**.

ERROR\_INVALID\_BLOCK\_OPEARTION\_MODE: Not DISABLE\_BLOCK\_OPEARTION is assigned to parameter **wBlockMode**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than or equal to **dwDriveSpeed**.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_JERK: The value assigned to parameter **dwAccelerationRate** is out of range of Acceleration Increasing Rate. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DECELERATION\_RATE: The value assigned to parameter **dwDecelerationRate** is out of range of Deceleration Increasing Rate. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INTERPOLATION\_NOT\_COMPLETE: The interpolation moving started before had not completed.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
 ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
 ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
 ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,  
 ERROR\_OCCURS\_IN\_AXIS\_ZU:

Indicates that some error happens to AXIS\_xxxx. Please call i8094\_get\_error\_status() for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with i8094\_set\_mpg().

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call GetLastError() for further system information.

ERROR\_S\_LINE2\_START: Cannot start S-curve 2D interpolation moving, please call GetLastError() for further system information.



### 5.1.3 i8094\_t\_line3\_move

short i8094\_t\_line3\_move(BYTE bSlotNum, WORD wMainAxis, WORD wSecondAxis, WORD wThirdAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAcceleration, DWORD dwDeceleration, long MainAxisFinishPoint, long SecondAxisFinishPoint, long ThirdAxisFinishPoint, short wAccCntOffset = 8, WORD wBlockMode = DISABLE\_BLOCK\_OPEARTION)

#### Description:

This function starts the trapezoidal-profile, 3-dimension linear interpolation moving.

#### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wMainAxis: The main-axis of interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wSecondAxis: The second-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U (cannot be the same as **wMainAxis**).

wThirdAxis: The third-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U (neither **wMainAxis** nor **wSecondAxis** can be assigned to **wThirdAxis**)

dwStartSpeed: The Start-Speed in trapezoidal-profile moving. This Start-Speed will be applied to main-axis.

dwDriveSpeed: The Drive-Speed in trapezoidal-profile moving. This Drive-Speed will be applied to main-axis.

dwAcceleration: The Acceleration in trapezoidal-profile moving. This Acceleration will be applied to main-axis.

dwDeceleration: The Deceleration in trapezoidal-profile moving. This Deceleration will be applied to main-axis.

MainAxisFinishPoint: The finish point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

SecondAxisFinishPoint: The finish point of second-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

ThirdAxisFinishPoint: The finish point of third-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

wAccCntOffset: This optional parameter to configure the offset for Acceleration/Deceleration driving. The default setting of **wAccCntOffset** is 8.

wBlockMode: The Block/Non-Block operation mode. Now only DISABLE\_BLOCK\_OPEARTION is valid.



**Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, *bSlotNum*; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter *wMainAxis*, *wSecondAxis* or *wThirdAxis*.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter *wMainAxis*, *wSecondAxis* or *wThirdAxis*.

ERROR\_INVALID\_INTERPOLATION\_SLAVE\_AXES: Either *wSecondAxis* or *wThirdAxis* includes the axis ID assigned to *wMainAxis*.

ERROR\_INTERPOLATION\_SLAVE\_AXES\_DUPLICATED: The axis ID assigned to *wSecondAxis* and *wThirdAxis* is the same.

ERROR\_INVALID\_BLOCK\_OPEARTION\_MODE: Not DISABLE\_BLOCK\_OPEARTION is assigned to parameter *wBlockMode*.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The *dwStartSpeed* is larger than *dwDriveSpeed*.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter *dwStartSpeed* is out of range of Speed. Please refer to *i8094\_set\_range()* and *i8094\_get\_range\_settings()*.

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter *dwDriveSpeed* is out of range of Speed. Please refer to *i8094\_set\_range()* and *i8094\_get\_range\_settings()*.

ERROR\_INVALID\_ACCELERATION: The value assigned to parameter *dwAcceleration* is out of range of Acceleration. Please refer to *i8094\_set\_range()* and *i8094\_get\_range\_settings()*.

ERROR\_INVALID\_DECELERATION: The value assigned to parameter *dwDeceleration* is out of range of Deceleration. Please refer to *i8094\_set\_range()* and *i8094\_get\_range\_settings()*.

**Notice:** In the case,  $dwAcceleration > dwDeceleration$ , the following formula should be satisfied, too.

$$dwDeceleration > (dwAcceleration \times dwDriveSpeed) / 4,000,000.$$

ERROR\_INTERPOLATION\_NOT\_COMPLETE: The interpolation moving started before had not completed.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,  
ERROR\_OCCURS\_IN\_AXIS\_ZU, ERROR\_OCCURS\_IN\_AXIS\_XYZ,  
ERROR\_OCCURS\_IN\_AXIS\_XYU, ERROR\_OCCURS\_IN\_AXIS\_XZU,

ERROR\_OCCURS\_IN\_AXIS\_YZU,;

Indicates that some error happens to AXIS\_xxxx. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call `GetLastError()` for further system information.

ERROR\_T\_LINE3\_START: Cannot start trapezoidal 3D interpolation moving, please call `GetLastError()` for further system information.

## 5.1.4 i8094\_s\_line3\_move

short i8094\_s\_line3\_move(BYTE bSlotNum, WORD wMainAxis, WORD wSecondAxis, WORD wThirdAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAccelerationRate, DWORD dwDecelerationRate, long MainAxisFinishPoint, long SecondAxisFinishPoint, long ThirdAxisFinishPoint, short wAccCntOffset = 8, WORD wBlockMode = DISABLE\_BLOCK\_OPEARTION)

### Description:

This function starts the S-curve, 3-dimension linear interpolation moving.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wMainAxis: The main-axis of interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wSecondAxis: Thhe second-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U (cannot be the same as **wMainAxis**).

wThirdAxis: The third-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U (neither **wMainAxis** nor **wSecondAxis** can be assigned to **wThirdAxis**)

dwStartSpeed: The Start-Speed in S-curve moving. This Start-Speed will be applied to main-axis.

dwDriveSpeed: The Drive-Speed in S-curve moving. This Drive-Speed will be applied to main-axis.

dwAccelerationRate: The Acceleration-Increasing-Rate in S-curve moving. The Acceleration will be assigned to maximum value automatically. This Acceleration-Increasing-Rate will be applied to main-axis.

dwDecelerationRate: The Deceleration-Increasing-Rate in S-curve moving. The Deceleration will be assigned to maximum value automatically. This Acceleration-Increasing-Rate will be applied to main-axis.

MainAxisFinishPoint: The finish point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

SecondAxisFinishPoint: The finish point of second-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

ThirdAxisFinishPoint: The finish point of third-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

wAccCntOffset: This optional parameter to configure the offset for Acceleration/Deceleration driving. The default setting of **wAccCntOffset** is 8.

wBlockMode: The Block/Non-Block operation mode. Now only DISABLE\_BLOCK\_OPEARTION is valid.

**Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wMainAxis**, **wSecondAxis** or **wThirdAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wMainAxis**, **wSecondAxis** or **wThirdAxis**.

ERROR\_INVALID\_INTERPOLATION\_SLAVE\_AXES: Either **wSecondAxis** or **wThirdAxis** includes the axis ID assigned to **wMainAxis**.

ERROR\_INTERPOLATION\_SLAVE\_AXES\_DUPLICATED: The axis ID assigned to **wSecondAxis** and **wThirdAxis** is the same.

ERROR\_INVALID\_BLOCK\_OPEARTION\_MODE: Not DISABLE\_BLOCK\_OPEARTION is assigned to parameter **wBlockMode**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than or equal to **dwDriveSpeed**.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_JERK: The value assigned to parameter **dwAccelerationRate** is out of range of Acceleration Increasing Rate. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DECELERATION\_RATE: The value assigned to parameter **dwDecelerationRate** is out of range of Deceleration Increasing Rate. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INTERPOLATION\_NOT\_COMPLETE: The interpolation moving started before had not completed.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,  
ERROR\_OCCURS\_IN\_AXIS\_ZU, ERROR\_OCCURS\_IN\_AXIS\_XYZ,  
ERROR\_OCCURS\_IN\_AXIS\_XYU, ERROR\_OCCURS\_IN\_AXIS\_XZU,

ERROR\_OCCURS\_IN\_AXIS\_YZU:

Indicates that some error happens to AXIS\_xxxx. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call `GetLastError()` for further system information.

ERROR\_S\_LINE3\_START: Cannot start S-curve 3D linear interpolation moving, please call `GetLastError()` for further system information.

## 5.1.5 i8094\_t\_arc2\_move

short i8094\_t\_arc2\_move(BYTE bSlotNum, WORD wMainAxis, WORD wSlaveAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAcceleration, WORD wArcDirection, long MainAxisCenterPoint, long SlaveAxisCenterPoint, long MainAxisFinishPoint, long SlaveAxisFinishPoint, short wAccCntOffset = 8, WORD wBlockMode = DISABLE\_BLOCK\_OPEARTION)

### Description:

This function starts the trapezoidal-profile, 2-dimension circular interpolation moving. Only symmetric trapezoidal Acceleration/Deceleration is applied to circular interpolation. The start-point will be the *Origin* of circular-interpolation motion. The **MainAxisCenterPoint** & **SlaveAxisCenterPoint** are center coordinates related to *Origin*; and **MainAxisFinishPoint** & **SlaveAxisFinishPoint** are finish coordinates related to *Origin*. The position tolerance for the specified circular curve is  $\pm 1$  within the interpolation range. When the value of finish-point reaches the coordinate of *short-axis*, the circular interpolation will be completed. Figure 4 illustrates the finish-point checking of circular interpolation.

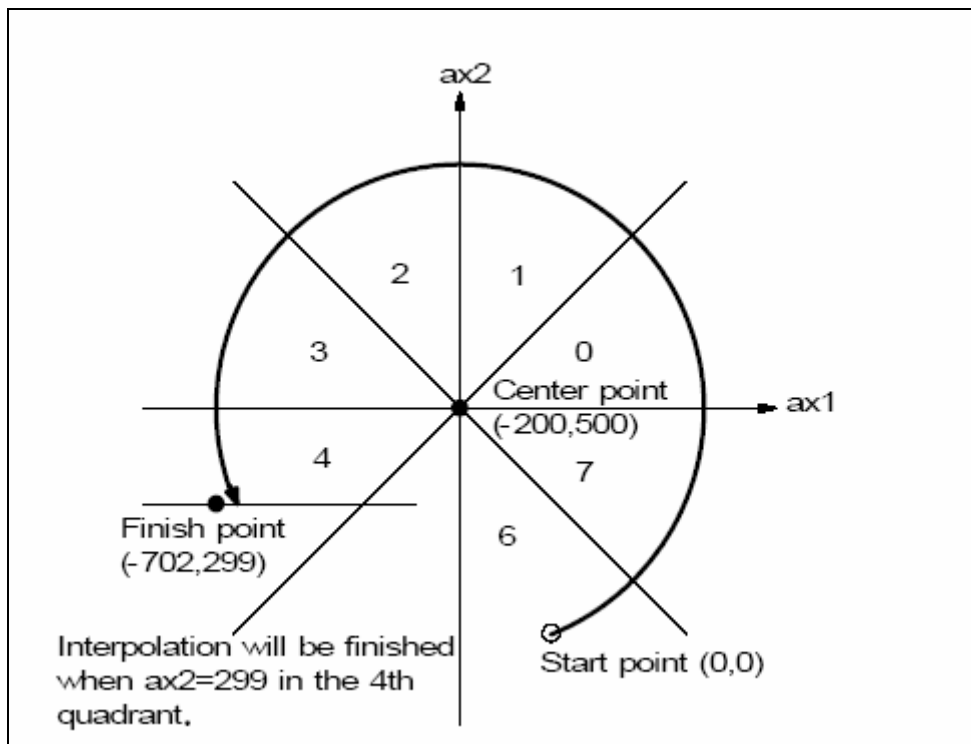


Figure 4 – finish-point checking of circular interpolation

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

**wMainAxis:** The main-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

**wSlaveAxis:** The slave-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U (cannot be the same as **wMainAxis**).

**dwStartSpeed:** The Start-Speed in trapezoidal-profile moving. This Start-Speed will be applied to main-axis.

**dwDriveSpeed:** The Drive-Speed in trapezoidal-profile moving. This Drive-Speed will be applied to main-axis.

**dwAcceleration:** The Acceleration in trapezoidal-profile moving. This Acceleration will be applied to main-axis.

**wArcDirection:** Clockwise (INTERP\_ARC\_DIRECTION\_CLOCKWISE) or Counter-Clockwise (INTERP\_ARC\_DIRECTION\_COUNTER\_CLOCKWISE).

**MainAxisCenterPoint:** The center point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

**SlaveAxisCenterPoint:** The center point of slave-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

**MainAxisFinishPoint:** The finish point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

**SlaveAxisFinishPoint:** The finish point of slave-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-direction.

**wAccCntOffset:** This optional parameter to configure the offset for Acceleration/Deceleration driving. The default setting of **wAccCntOffset** is 8.

**wBlockMode:** The Block/Non-Block operation mode. Now only DISABLE\_BLOCK\_OPEARTION is valid.

**Return Code:**

**SUCCESS\_NO\_ERROR:** The function returns successfully.

**ERROR\_INVALID\_CARD\_ID:** There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

**ERROR\_MULTI\_AXES\_ASSIGNED:** Multiple axes are assigned to parameter **wMainAxis** or **wSlaveAxis**.

**ERROR\_NO\_VALID\_AXIS\_ASSIGNED:** No valid axis ID is assigned to parameter **wMainAxis** or **wSlaveAxis**.

**ERROR\_INVALID\_INTERPOLATION\_ARC\_DIRECTION:** Neither INTERP\_ARC\_DIRECTION\_CLOCKWISE nor

INTERP\_ARC\_DIRECTION\_COUNTER\_CLOCKWISE is assigned to parameter **wArcDirection**.

ERROR\_INVALID\_INTERPOLATION\_SLAVE\_AXES: The parameter **wSlaveAxis** includes the axis ID assigned to **wMainAxis**.

ERROR\_INVALID\_BLOCK\_OPEARTION\_MODE: Not DISABLE\_BLOCK\_OPEARTION is assigned to parameter **wBlockMode**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than **dwDriveSpeed**.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_INVALID\_ACCELERATION: The value assigned to parameter **dwAcceleration** is out of range of Acceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_ARC\_DECELERATION\_POINT\_CALCULATE: The path of circular moving is too small. Please try to increase the circular-path.

ERROR\_INTERPOLATION\_NOT\_COMPLETE: The interpolation moving started before had not completed.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z, ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY, ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ, ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU, ERROR\_OCCURS\_IN\_AXIS\_ZU:

Indicates that some error happens to AXIS\_xxxx. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with `i8094_set_mpg()`.

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call `GetLastError()` for further system information.

ERROR\_T\_ARC2\_START: Cannot start circular interpolation moving, please call `GetLastError()` for further system information.



## 5.2 Continuous Interpolation Moving

The continuous interpolation provides none-stop linear & circular interpolation moving. The continuous interpolation moving is combined with multiple linear & circular interpolation segments. To add arbitrary interpolation segment, only the constant Vector-Speed is applied to continuous-interpolation moving.

The continuous interpolation moving is configured with `i8094_conti_interp_begin()` and completed with `i8094_conti_interp_end()`. All settings that are configured with `i8094_conti_interp_begin()` will be kept in driver until `i8094_conti_interp_end()` being called. The interpolation segments after `i8094_conti_interp_begin()` will use these configurations, including axes involved in interpolation-moving and constant Vector-Speed.

To avoid the continuous interpolation to be interrupted, the configurations of next interpolation segment had better be set as soon as possible. The function, `i8094_conti_interp_next_ready()`, indicates the next interpolation segment is ready to be configured.

In case the continuous-interpolation moving is terminated, you could re-start the uncompleted interpolation segments with `INTERP_CONTINUE_START` setting in parameter ***wContiInterpMoveMode***. The typical programming following-chart is described in Figure 5. Please refer to the 'Conti\_Interp' sample.

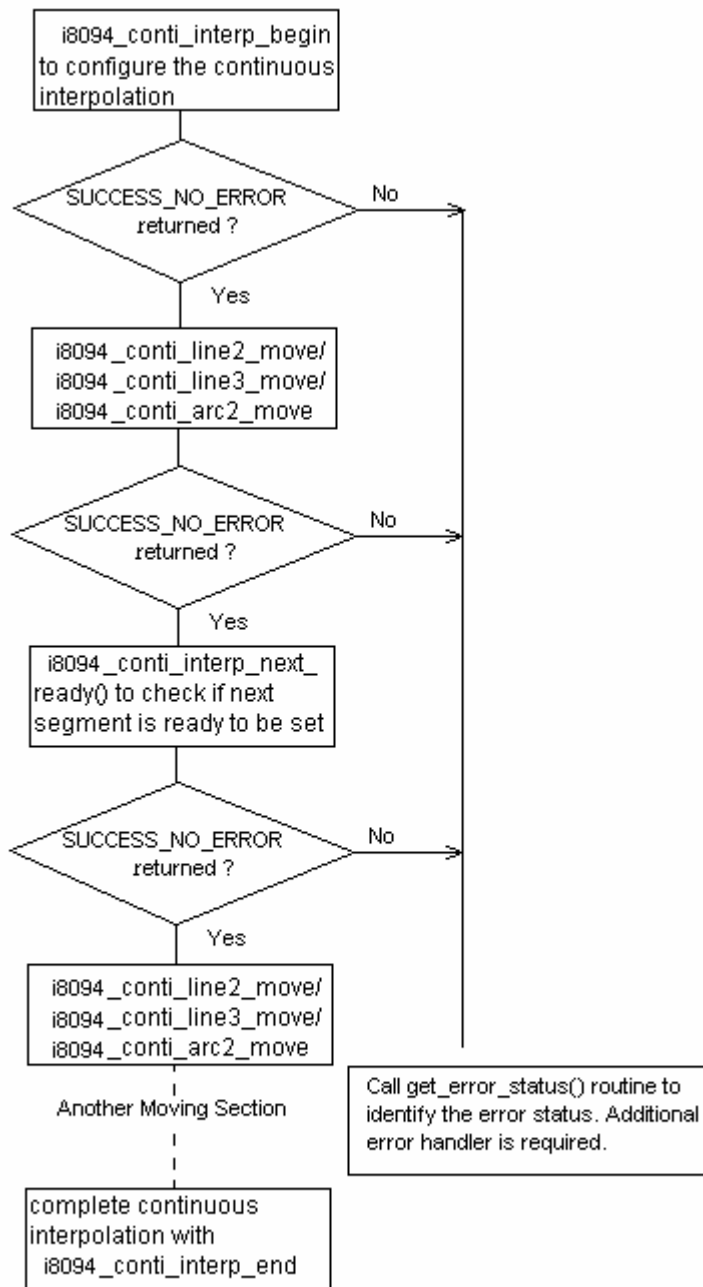


Figure 5 - typical programming following-chart of continuous-interpolation

## 5.2.1 i8094\_conti\_interp\_begin

short i8094\_conti\_interp\_begin(BYTE bSlotNum, WORD wMainAxis, WORD wSecondAxis, WORD wThirdAxis, DWORD dwConstSpeed)

### Description:

This function configures the involved axes, the constant vector-speed in continuous interpolation moving.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wMainAxis: The main-axis of interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wSecondAxis: The second-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U (cannot be the same as **wMainAxis**).

wThirdAxis: The third-axis of Interpolation moving, can be one of AXIS\_X, AXIS\_Y, AXIS\_Z, AXIS\_U or INVALID\_AXIS\_ASSIGNMENT. (neither **wMainAxis** nor **wSecondAxis** can be assigned to **wThirdAxis**).

dwConstSpeed: The constant Vector-Speed in continuous interpolation. This parameter should be less than 2,000,000 PPS )

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wMainAxis**, **wSecondAxis** or **wThirdAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wMainAxis**, **wSecondAxis** or **wThirdAxis**.

ERROR\_INVALID\_INTERPOLATION\_SLAVE\_AXES: Either **wSecondAxis** or **wThirdAxis** includes the axis ID assigned to **wMainAxis**.

ERROR\_INTERPOLATION\_SLAVE\_AXES\_DUPLICATED: The axis ID assigned to **wSecondAxis** and **wThirdAxis** is the same.

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INTERPOLATION\_NOT\_COMPLETE: The previous interpolation-moving had not been completed.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,  
ERROR\_OCCURS\_IN\_AXIS\_ZU, ERROR\_OCCURS\_IN\_AXIS\_XYZ,  
ERROR\_OCCURS\_IN\_AXIS\_XYU, ERROR\_OCCURS\_IN\_AXIS\_XZU,  
ERROR\_OCCURS\_IN\_AXIS\_YZU:

Indicates that some error happens to AXIS\_xxxx. Please call i8094\_get\_error\_status() for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_CONFLICT\_WITH\_MPG: Indicates the previous Manual-Pulse-Generator setting is active. Please disable MPG settings with i8094\_set\_mpg().

ERROR\_AXES\_MOVE\_CHECK: Cannot forward the Axes-checking command to system, please call GetLastError() for further system information.

ERROR\_INVALID\_RANGE: The assigned value is invalid.

ERROR\_RANGE\_CHANGE: Cannot change the settings of **Range** register, please call GetLastError() for further system information.

ERROR\_CONTI\_INTERP\_SET: Cannot configure continuous-interpolation moving, please call GetLastError() for further system information.

## 5.2.2 i8094\_conti\_interp\_next\_ready

short i8094\_conti\_interp\_next\_ready(BYTE bSlotNum, BYTE \*pReady)

### Description:

This function checks if the next interpolation segment is ready to be set.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

pReady: The pointer to the memory that stores the ready-status of next interpolation segment.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_CONFIG\_IS\_NEEDED: The continuous interpolation had not been configured. Please call i8094\_conti\_interp\_begin() first.

ERROR\_CONTI\_INTERP\_NEXT\_READY: Cannot get the next-ready status, please call GetLastError() for further system information.

## 5.2.3 i8094\_conti\_line2\_move

short i8094\_conti\_line2\_move(BYTE bSlotNum, long MainAxisFinishPoint, long SlaveAxisFinishPoint, WORD wContiInterpMoveMode)

### Description:

This function starts the constant vector-speed, 2-dimension linear interpolation moving.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

MainAxisFinishPoint: The finish point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way.

SlaveAxisFinishPoint: The finish point of slave-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way

wContiInterpMoveMode:

INTERP\_CONTINUE\_START: indicates the begin of continuous interpolation moving.

INTERP\_NEXT\_CONTINUOUS\_MOTION: indicates the interpolation segment is one part of continuous interpolation moving, and the interrupt of motion checking is involved implicitly.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_CONFIG\_IS\_NEEDED: The continuous interpolation had not been configured. Please call i8094\_conti\_interp\_begin() first.

ERROR\_INVALID\_CONTINUE\_INTERPOLATION\_MOTION: Neither INTERP\_CONTINUE\_START nor INTERP\_NEXT\_CONTINUOUS\_MOTION is assigned to parameter **wContiInterpMoveMode**.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,

ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,

ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,

ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,

ERROR\_OCCURS\_IN\_AXIS\_ZU:

Indicates that some error happens to AXIS\_xxxx. Please call i8094\_get\_error\_status() for detailed information.

ERROR\_CONTI\_INTERP\_INTERRUPTED: Indicates the continuous interpolation moving is interrupted. This code is returned only when **wContiInterpMoveMode** is set as INTERP\_NEXT\_CONTINUOUS\_MOTION.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed. This code is returned only when **wContiInterpMoveMode** is set as INTERP\_CONTINUE\_START.

ERROR\_CONTI\_INTERP\_NEXT\_NOT\_READY: Indicates the internal Motion-Control ASIC is not ready to set the next interpolation segment. Please call i8094\_conti\_interp\_next\_ready() first.

ERROR\_CONTI\_INTERP\_LINE2\_MOVE: Cannot start i8094\_conti\_line2\_move, please call GetLastError() for further system information.

## 5.2.4 i8094\_conti\_line3\_move

short i8094\_conti\_line3\_move(BYTE bSlotNum, long MainAxisFinishPoint, long SecondAxisFinishPoint, long ThirdAxisFinishPoint, WORD wContiInterpMoveMode)

### Description:

This function starts the constant vector-speed, 3-dimension linear interpolation moving.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

MainAxisFinishPoint: The finish point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way.

SecondAxisFinishPoint: The finish point of second-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way

ThirdAxisFinishPoint: The finish point of third-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way

wContiInterpMoveMode:

INTERP\_CONTINUE\_START: indicates the begin of continuous interpolation moving.

INTERP\_NEXT\_CONTINUOUS\_MOTION: indicates the interpolation segment is one part of continuous interpolation moving, and the interrupt of motion checking in involved implicitly.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_CONFIG\_IS\_NEEDED: The continuous interpolation had not been configured. Please call i8094\_conti\_interp\_begin() first.

ERROR\_INVALID\_CONTINUE\_INTERPOLATION\_MOTION: Neither INTERP\_CONTINUE\_START nor INTERP\_NEXT\_CONTINUOUS\_MOTION is assigned to parameter **wContiInterpMoveMode**.

ERROR\_CONTI\_INTERP\_INCORRECT\_CONFIG: Only two axes are configured with i8094\_conti\_interp\_begin(), and i8094\_conti\_line3\_move() failed to execute.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,



ERROR\_OCCURS\_IN\_AXIS\_ZU, ERROR\_OCCURS\_IN\_AXIS\_XYZ,  
ERROR\_OCCURS\_IN\_AXIS\_XYU, ERROR\_OCCURS\_IN\_AXIS\_XZU,  
ERROR\_OCCURS\_IN\_AXIS\_YZU:

Indicates that some error happens to AXIS\_xxxx. Please call `i8094_get_error_status()` for detailed information.

ERROR\_CONTI\_INTERP\_INTERRUPTED: Indicates the continuous interpolation moving is interrupted. This code is returned only when **wContiInterpMoveMode** is set as INTERP\_NEXT\_CONTINUOUS\_MOTION.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed. This code is returned only when **wContiInterpMoveMode** is set as INTERP\_CONTINUE\_START.

ERROR\_CONTI\_INTERP\_NEXT\_NOT\_READY: Indicates the internal Motion-Control ASIC is not ready to set the next interpolation segment, please call `i8094_conti_interp_next_ready()` first.

ERROR\_CONTI\_INTERP\_LINE3\_MOVE: Cannot start `i8094_conti_line3_move`, please call `GetLastError()` for further system information.

## 5.2.5 i8094\_conti\_arc2\_move

short i8094\_conti\_arc2\_move(BYTE bSlotNum, WORD wArcDirection, long MainAxisCenterPoint, long SlaveAxisCenterPoint, long MainAxisFinishPoint, long SlaveAxisFinishPoint, WORD wContiInterpMoveMode)

### Description:

This function starts the constant vector-speed, 2-dimension linear interpolation moving.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wArcDirection: Clockwise (INTERP\_ARC\_DIRECTION\_CLOCKWISE) or Counter-Clockwise (INTERP\_ARC\_DIRECTION\_COUNTER\_CLOCKWISE).

MainAxisCenterPoint: The center point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way.

SlaveAxisCenterPoint: The center point of slave-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way

MainAxisFinishPoint: The finish point of main-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way.

SlaveAxisFinishPoint: The finish point of slave-axis. This parameter is the relative offset to the current position. And the negative value indicates that the finish point is in reverse-way

wContiInterpMoveMode:

INTERP\_CONTINUE\_START: indicates the begin of continuous interpolation moving.

INTERP\_NEXT\_CONTINUOUS\_MOTION: indicates the interpolation segment is one part of continuous interpolation moving, and the interrupt of motion checking in involved implicitly.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_CONFIG\_IS\_NEEDED: The continuous interpolation had not been configured. Please call i8094\_conti\_interp\_begin() first.

ERROR\_INVALID\_CONTINUE\_INTERPOLATION\_MOTION: Neither INTERP\_CONTINUE\_START nor INTERP\_NEXT\_CONTINUOUS\_MOTION is assigned to parameter **wContiInterpMoveMode**.

ERROR\_INVALID\_INTERPOLATION\_ARC\_DIRECTION: Neither  
INTERP\_ARC\_DIRECTION\_CLOCKWISE nor  
INTERP\_ARC\_DIRECTION\_COUNTER\_CLOCKWISE is assigned to parameter  
**wArcDirection**.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z,  
ERROR\_OCCURS\_IN\_AXIS\_U, ERROR\_OCCURS\_IN\_AXIS\_XY,  
ERROR\_OCCURS\_IN\_AXIS\_XZ, ERROR\_OCCURS\_IN\_AXIS\_YZ,  
ERROR\_OCCURS\_IN\_AXIS\_XU, ERROR\_OCCURS\_IN\_AXIS\_YU,  
ERROR\_OCCURS\_IN\_AXIS\_ZU:

Indicates that some error happens to AXIS\_xxxx. Please call i8094\_get\_error\_status()  
for detailed information.

ERROR\_CONTI\_INTERP\_INTERRUPTED: Indicates the continuous interpolation moving is  
interrupted. This code is returned only when **wContiInterpMoveMode** is set as  
INTERP\_NEXT\_CONTINUOUS\_MOTION.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed. This code is  
returned only when **wContiInterpMoveMode** is set as INTERP\_CONTINUE\_START.

ERROR\_CONTI\_INTERP\_NEXT\_NOT\_READY: Indicates the internal Motion-Control ASIC is not  
ready to set the next interpolation segment, please call i8094\_conti\_interp\_next\_ready()  
first.

ERROR\_CONTI\_INTERP\_ARC2\_MOVE: Cannot start i8094\_conti\_arc2\_move, please call  
GetLastError() for further system information.

## 5.2.6 i8094\_conti\_interp\_end

short i8094\_conti\_interp\_end (BYTE bSlotNum)

### Description:

This function completes the continuous-interpolation moving, and clears the related configurations kept in driver.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_INVALID\_RANGE: The assigned value is invalid.

ERROR\_RANGE\_CHANGE: cannot change the settings of **Range** register, please call GetLastError() for further system information.

ERROR\_CONTI\_INTERP\_CLEAR: Cannot clear continuous-interpolation settings, please call GetLastError() for further system information.

## Other Motion Functions

This chapter introduces several helpful functions, including `i8094_stop_move()`, `i8094_drv_hold()` and `i8094_drv_start()`.

### 6.1 `i8094_stop_move`

short `i8094_stop_move`(BYTE `bSlotNum`, WORD `wAxis`, WORD `wStopMode`)

**Description:**

This function stops current motion with slowdown or stop-sudden mode. Please call `i8094_motion_done()` to make sure that specific axis stop before starting next motion.

**Parameters:**

`bSlotNum`: The specific slot number that i-8094 installed on.

`wAxis`: Can be one of `AXIS_X`, `AXIS_Y`, `AXIS_Z` or `AXIS_U`.

`wStopMode`: `STOP_SLOWDOWN` or `STOP_SUDDEN`.

**Return Code:**

`SUCCESS_NO_ERROR`: The function returns successfully.

`ERROR_INVALID_CARD_ID`: There is no active i-8094 module on the given slot, `bSlotNum`; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

`ERROR_MULTI_AXES_ASSIGNED`: Multiple axes are assigned to parameter ***wAxis***.

`ERROR_NO_VALID_AXIS_ASSIGNED`: No valid axis ID is assigned to parameter ***wAxis***.

`ERROR_INVALID_STOP_MODE`: Neither `STOP_SLOWDOWN` nor `STOP_SUDDEN` is assigned to parameter ***wStopMode***.

`ERROR_MOTION_STOP_SET`: Cannot stop current motion, please call `GetLastError()` for further system information.

## 6.2 i8094\_stop\_move\_all

short i8094\_stop\_move\_all(BYTE bSlotNum, WORD wAxes, WORD wStopMode)

### Description:

This helpful function stops motion of multiple axes. Please call i8094\_motion\_done() to make sure that all axes stop before starting next motion.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxes: can be any combination of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wStopMode: STOP\_SLOWDOWN or STOP\_SUDDEN.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Invalid axis-combination is assigned to parameter **wAxes**.

ERROR\_INVALID\_STOP\_MODE: Neither STOP\_SLOWDOWN nor STOP\_SUDDEN is assigned to parameter **wStopMode**.

ERROR\_MOTION\_STOP\_SET: Cannot stop current motion, please call GetLastError() for further system information.

## 6.3 i8094\_drv\_hold

short i8094\_drv\_hold(BYTE bSlotNum, WORD wAxes)

### Description:

This function holds the motion-starting of the involved axes. And these involved axes will start moving simultaneously when i8094\_drv\_start() is called.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxes: Can be any combination of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Invalid axis-combination is assigned to parameter **wAxes**.

ERROR\_HOLD\_AXES\_NOT\_RELEASE: Indicates the some axes had been hold, please call i8094\_drv\_start() to release the hold-axes first.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_DRIVE\_HOLD: Cannot hold the motion-starting, please call GetLastError() for further system information.

## 6.4 i8094\_drv\_start

short i8094\_drv\_start(BYTE bSlotNum, WORD wAxes)

### Description:

This function starts multiple axes simultaneously that are held by i8094\_drv\_hold().

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxes: Can be any combination of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Invalid axis-combination is assigned to parameter **wAxes**.

ERROR\_HOLD\_AXES\_NOT\_MATCH: The axes that will to be started are not match to the axes that are held by i8094\_drv\_hold().

ERROR\_DRIVE\_START: Cannot start motion of held axes, please call GetLastError() for further system information.



# Advanced Motion Configurations

This chapter introduces some advanced features, including variable-ring counter, manual-pulse-generator and the synchronous-action between axes.

The advanced features are special, and maybe not co-exist with normal operation. It's recommended to disable these functions when they are not needed.

## 7.1 i8094\_set\_vring

short i8094\_set\_vring(BYTE bSlotNum, WORD wAxis, WORD wVRINGEnable, DWORD dwRingValue)

### Description:

This function enables and configures the variable-ring feature for both logic-command and encoder-position counters. After enabling variable-ring feature, these two counters will be reset to zero automatically.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wVRINGEnable: VARIABLE\_RING\_ENABLE\_FEATURE or VARIABLE\_RING\_DISABLE\_FEATURE.

dwRingValue: The total numbers that counter can count. ( $2 < dwRingValue$ ).

For instance, assigning 10,000 to dwRingValue indicates the operation of ring-counter

will be: increasing in forward direction ... →9998→9999→0→1→...

decreasing in reserve direction ...→1→0→9999→9998→...

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

**ERROR\_INVALID\_CARD\_ID:** There is no active i-8094 module on the given slot, `bSlotNum`; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

**ERROR\_MULTI\_AXES\_ASSIGNED:** Multiple axes are assigned to parameter ***wAxis***.

**ERROR\_NO\_VALID\_AXIS\_ASSIGNED:** No valid axis ID is assigned to parameter ***wAxis***.

**ERROR\_INVALID\_RING\_COUNTER:** Indicates the parameter ***dwRingValue*** is less than 2.

**ERROR\_INVALID\_FILTER\_ENABLE:** Neither `VARIABLE_RING_ENABLE_FEATURE` nor `VARIABLE_RING_DISABLE_FEATURE` is assigned to parameter ***wVRINGEnable***.

**ERROR\_CONFLICT\_WITH\_SOFTLIMIT:** Indicates that the AXIS-Internal Comparators are used for software-limit. Please disable software-limit feature with `i8094_set_softlimit()`.

**ERROR\_CONFLICT\_WITH\_SYNCH\_ACTION:** Indicates that the ASIC-Internal Comparators are used as the condition of Synchronous-Action. Please disable synchronous-condition with `i8094_set_synch()`.

**ERROR\_VRING\_SET:** Cannot enable/configure the variable-ring feature, please call `GetLastError()` for further system information.

## 7.2 i8094\_set\_mpg

short i8094\_set\_mpg(BYTE bSlotNum, WORD wAxis, WORD wEXPCConfig, DWORD dwFixedPulse, DWORD dwSpeed, DWORD dwMaxMPGFreq)

### Description:

This function enables and configures the manual-pulse-generator feature. After enabling manual-pulse-generator feature, the constant-speed motion will be started when every pulse is sent from external manual-pulse-generator.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wEXPCConfig: EXP\_AB\_PHASE\_MPG, EXP\_CW\_CCW\_ACTIVE\_LOW\_MPG or EXP\_DISABLE\_FEATURE.

dwFixedPulse: Indicates the numbers of pulse will be output when each pulse is sent from manual-pulse-generator. For instance, assigning 5 to this parameter, 5 pulses will be output when each pulse is sent from external manual-pulse-generator.

dwSpeed: The constant-speed of output pulse.

dwMaxMPGFreq: The maximum frequency of the manual-pulse-generator. Please check the datasheet of manual-pulse-generator.

**Notice:** the following formula is needed to be satisfied:

$$\text{dwSpeed} \quad \text{dwMaxMPGFreq} \times \text{dwFixedPulse} \times 2.$$

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_MPG\_EXP\_CONFIG: Indicates the invalid MPG setting is assigned to parameter **wEXPCConfig**.

ERROR\_INVALID\_MPG\_SPEED: The value assigned to parameter **dwSpeed** is out of range of Speed or is less than **2 x dwMaxMPGFreq x dwFixedPulse**.

ERROR\_MPG\_SET: Cannot enable/configure the manual-pulse-generator, please call GetLastError() for further system information.

## 7.3 i8094\_set\_int\_factor

short i8094\_set\_int\_factor(BYTE bSlotNum, WORD wAxis, WORD wIntFactor)

### Description:

This function configures the motion-related interrupt-factors. Please call i8094\_get\_int\_status() to get the relevant interrupt-status;

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wIntFactor: The interrupt factor can be the combination of following settings:

INT\_FACTOR\_DISABLE: disables all interrupt factors.

INT\_FACTOR\_PULSE: interrupt will be triggered when pulse is at its active level.

For instance, if the PULSE\_LOGIC\_ACTIVE\_HIGH is configured in

i8094\_set\_pls\_cfg(), the interrupt will raised at each raising-edge of output-pulse.

INT\_FACTOR\_EXCEED\_CMP\_NEGATIVE: interrupt will be triggered while the content of logic-command/encoder-position counter is larger than COMP- comparator.

INT\_FACTOR\_LESS\_CMP\_NEGATIVE: interrupt will be triggered while the content of logic-command/encoder-position counter is less than COMP- comparator.

INT\_FACTOR\_LESS\_CMP\_POSITIVE: interrupt will be triggered while the content of logic-command/encoder-position counter is less than COMP+ comparator.

INT\_FACTOR\_EXCEED\_CMP\_POSITIVE: interrupt will be triggered while the content of logic-command/encoder-position counter is larger than COMP+ comparator.

INT\_FACTOR\_END\_CONST\_SPEED\_MOVE: interrupt will be triggered when the constant-speed moving is completed.

INT\_FACTOR\_START\_CONST\_SPEED\_MOVE: interrupt will be triggered when the constant-speed moving is started.

INT\_FACTOR\_END\_DRIVING: interrupt will be triggered when the motion is completed.

### Notice:

If the INT\_FACTOR\_START\_CONST\_SPEED\_MOVE is set, the interrupt will be triggered both at the end of Acceleration and Deceleration.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_INT\_FACTOR: Indicates the invalid interrupt factor is assigned to parameter **wIntFactor**.

ERROR\_INT\_FACTOR\_SET: Cannot enable/configure the specific interrupt factor, please call GetLastError() for further system information.

## 7.4 i8094\_set\_synch

short i8094\_set\_synch(BYTE bSlotNum, WORD wMainAxis, WORD wSyncEnable, WORD wSyncAxes, WORD wSyncCondition, WORD wSyncActionMainAxis, WORD wSyncActionOtherAxes, WORD wCmpSource, DWORD dwComparatorPositive, DWORD dwComparatorNegative)

### Description:

This function enables and configures the synchronous condition/actions in main-axis and other axes that the synchronous action will be applied to.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wMainAxis: The main-axis of synchronous-action, this parameter can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_Y.

wSyncEnable: SYNC\_ENABLE\_FEATURE or SYNC\_DISABLE\_FEATURE.

wSyncAxes: The other involved axes of synchronous-action, they be any combination of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U. However, this parameter cannot include **wMainAxis**.

wSyncCondition: The conditions of main-axis to start synchronous-actions, including  
SYNC\_CONDITION\_EXCEED\_CMP\_POSITIVE: the value of counter COMP+.  
SYNC\_CONDITION\_LESS\_CMP\_POSITIVE: the value of counter < COMP+.  
SYNC\_CONDITION\_LESS\_CMP\_NEGATIVE: the value of counter < COMP-.  
SYNC\_CONDITION\_EXCEED\_CMP\_NEGATIVE: the value of counter COMP-.  
SYNC\_CONDITION\_START\_DRIVING: moving is started.  
SYNC\_CONDITION\_END\_DRIVING: moving is completed or terminated.

wSyncActionMainAxis: When the synchronous-condition is satisfied, the synchronous action that can be applied to main-axis, including:

SYNC\_ACTION\_NONE: no synchronous action is applied to main-axis.

SYNC\_ACTION\_LOGIC\_CMD\_LATCH: stores the content of logic-command counter into **Buffer** Register.

SYNC\_ACTION\_ENCODER\_POS\_LATCH: stores the content of encoder-position counter into **Buffer** Register.

wSyncActionOtherAxes: When the synchronous-condition is satisfied, the synchronous action that can be applied to other axes, including:

SYNC\_ACTION\_NONE: no synchronous action is applied to other axes.

SYNC\_ACTION\_FIXED\_FORWARD\_DRIVE: starts the fixed-pulse moving in forward direction.

SYNC\_ACTION\_FIXED\_REVERSE\_DRIVE: starts the fixed-pulse moving in reverse direction.

SYNC\_ACTION\_CONTINUE\_FORWARD\_DRIVE: starts the velocity moving in forward direction.

SYNC\_ACTION\_CONTINUE\_REVERSE\_DRIVE: starts the velocity moving in reverse direction.

SYNC\_ACTION\_SLOWDOWN\_STOP: stops the current motion with slowdown mode.

SYNC\_ACTION\_SUDDEN\_STOP: stops the current motion immediately.

SYNC\_ACTION\_LOGIC\_CMD\_LATCH: stores the content of logic-command counter into **Buffer** Register.

SYNC\_ACTION\_ENCODER\_POS\_LATCH: stores the content of encoder-position counter into **Buffer** Register.

wCmpSource: CMP\_SRC\_LOGIC\_COMMAND or CMP\_SRC\_ENCODER\_POSITION

dwComparatorPositive: the value to be set into COMP+.

dwComparatorNegative: the value to be set into COMP-.

**Notice:** please refer to i8094\_get\_latch() to read the **Buffer** register.

#### **Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wMainAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wMainAxis**.

ERROR\_INVALID\_SYNCHRONOUS\_AXES: Indicates invalid axes are assigned to parameter **wSyncAxes**.

ERROR\_INVALID\_SYNCH\_ENABLE: Neither SYNC\_ENABLE\_FEATURE nor SYNC\_DISABLE\_FEATURE is assigned to parameter **wSyncEnable**.

ERROR\_INVALID\_SYNCH\_CONDITION: Indicates no valid synchronous-condition is assigned to parameter **wSyncCondition**.

ERROR\_INVALID\_SYNCH\_ACTION: Indicates invalid synchronous-action is assigned to parameter **wSyncActionMainAxis** or **wSyncActionOtherAxes**.

ERROR\_INVALID\_COMPARE\_SOURCE: Neither CMP\_SRC\_LOGIC\_COMMAND nor CMP\_SRC\_ENCODER\_POSITION is assigned to parameter **wCmpSource**.

ERROR\_CONFLICT\_WITH\_SOFTLIMIT: Indicates that the AXIS-Internal Comparators are used for software-limit. Please disable software-limit feature with i8094\_set\_softlimit().

ERROR\_CONFLICT\_WITH\_VRING: Indicates that the ASIC-Internal Comparators are used for Variable-Ring counter. Please disable Variable-Ring counter with i8094\_set\_vring().

ERROR\_SYNCH\_SET: Cannot enable/configure the synchronous condition & actions, please call  
GetLastError() for further system information.



## 7.5 i8094\_synch\_t\_move\_cfg

short i8094\_synch\_t\_move\_cfg(BYTE bSlotNum, WORD wAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAcceleration, DWORD dwDeceleration, long FixedPulse)

### Description:

This function configures the necessary parameters of trapezoidal-profile moving. This function is helpful when the synchronous-action is set as SYNC\_ACTION\_XXXX\_XXXXXXXX\_DRIVE.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: This axis should be one axis of the parameter **wSyncAxes** that is assigned to i8094\_set\_synch().

dwStartSpeed: The Start-Speed in trapezoidal-profile moving.

dwDriveSpeed: The Drive-Speed in trapezoidal-profile moving.

dwAcceleration: The Acceleration in trapezoidal-profile moving.

dwDeceleration: The Deceleration in trapezoidal-profile moving.

FixedPulse: The total numbers of output pulse. This parameter is a signed 32-bits variable, the negative value indicates motion in reverse-direction

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than **dwDriveSpeed**.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_ACCELERATION: The value assigned to parameter **dwAcceleration** is out of range of Acceleration. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DECELERATION: The value assigned to parameter ***dwDeceleration*** is out of range of Deceleration. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

**Notice:** In the case, ***dwAcceleration*** > ***dwDeceleration*** , the following formula should be satisfied, too.

$$\mathbf{dwDeceleration} > (\mathbf{dwAcceleration} \times \mathbf{dwDriveSpeed}) / 4,000,000.$$

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z  
ERROR\_OCCURS\_IN\_AXIS\_U:

Indicates that some error happens to AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_T\_MOVE\_START: Cannot configure the parameters of trapezoidal moving, please call `GetLastError()` for further system information.

## 7.6 i8094\_synch\_s\_move\_cfg

short i8094\_synch\_s\_move\_cfg(BYTE bSlotNum, WORD wAxis, DWORD dwStartSpeed, DWORD dwDriveSpeed, DWORD dwAccelerationRate, DWORD dwDecelerationRate, long FixedPulse)

### Description:

This function configures the necessary parameters of S-curve moving. This function is helpful when the synchronous-action is set as SYNC\_ACTION\_FIXED\_XXXXXXXX\_DRIVE.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: This axis should be one axis of the parameter **wSyncAxes** that is assigned to i8094\_set\_synch().

dwStartSpeed: The Start-Speed in S-curve moving.

dwDriveSpeed: The Drive-Speed in S-curve moving.

dwAccelerationRate: The Acceleration-Increasing-Rate in S-curve moving. The Acceleration will be assigned to maximum value automatically.

dwDecelerationRate: The Deceleration-Increasing-Rate in S-curve moving. The Deceleration will be assigned to maximum value automatically.

FixedPulse: The total numbers of output pulse. This parameter is a signed 32-bits variable, the negative value indicates motion in reverse-direction

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_START\_SPEED\_EXCEED\_DRIVING\_SPEED: The **dwStartSpeed** is larger than or equal to **dwDriveSpeed**.

ERROR\_INVALID\_START\_SPEED: The value assigned to parameter **dwStartSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_JERK: The value assigned to parameter **dwAccelerationRate** is out of range of Acceleration Increasing Rate. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_INVALID\_DECELERATION\_RATE: The value assigned to parameter ***dwDecelerationRate*** is out of range of Deceleration Increasing Rate. Please refer to `i8094_set_range()` and `i8094_get_range_settings()`.

ERROR\_OCCURS\_IN\_AXIS\_X, ERROR\_OCCURS\_IN\_AXIS\_Y, ERROR\_OCCURS\_IN\_AXIS\_Z  
ERROR\_OCCURS\_IN\_AXIS\_U:

Indicates that some error happens to AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U. Please call `i8094_get_error_status()` for detailed information.

ERROR\_MOTION\_NOT\_COMPLETE: Indicates the previous motion is not completed.

ERROR\_S\_MOVE\_START: Cannot configure the parameters of S-curve moving, please call `GetLastError()` for further system information.

# Miscellaneous Functions

This chapter introduces some functions that are difficult to be cataloged, including setting the logic-command counter and encoder-position counter, triangle prevention of trapezoidal-profile fixed-pulse driving, changing driving-speed while trapezoidal-profile moving and updating the total numbers of output pulse.

## 8.1 i8094\_t\_change\_v

short i8094\_t\_change\_v(BYTE bSlotNum, WORD wAxis, DWORD dwDriveSpeed)

### Description:

This function changes the Drive-Speed during trapezoidal-profile moving.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwDriveSpeed: The Drive-Speed in trapezoidal-profile moving.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_DRIVING\_SPEED: The value assigned to parameter **dwDriveSpeed** is out of range of Speed. Please refer to i8094\_set\_range() and i8094\_get\_range\_settings().

ERROR\_SPEED\_CHANGE\_FAIL\_IN\_ACC\_DEC: Indicates the Drive-Speed cannot be changed during Acceleration/Deceleration.

ERROR\_INVALID\_OPERATION\_IN\_S\_CURVE: Indicates the Drive-Speed cannot be applied to S-curve moving.

ERROR\_NOT\_CONSTANT\_SPEED\_IN\_T\_MOVE: Indicates the Drive-Speed cannot be changed in non-constant speed area of trapezoidal-profile moving.

ERROR\_T\_DRIVING\_SPEED\_CHANGE: Cannot change the Drive-Speed, please call GetLastError() for further system information.

## 8.2 i8094\_t\_set\_avtri

short i8094\_t\_set\_avtri(BYTE bSlotNum, WORD wAxis, WORD wAvTriCfg)

### Description:

This function enables the triangle prevention of fixed-pulse, trapezoidal-profile moving. After enabling this feature, the Motion-Control ASIC will determine the deceleration-point by the following formula:

*Numbers of output pulse*      $2 \times (\text{pulse number at Acceleration} + \text{pulse number at Deceleration})$ .

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

wAvTriCfg: AVOID\_TRIANGLE\_ENABLE\_FEATURE or AVOID\_TRIANGLE\_DISABLE\_FEATURE.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_INVALID\_AVOID\_TRIANGLE\_CONFIG: Neither AVOID\_TRIANGLE\_ENABLE\_FEATURE nor AVOID\_TRIANGLE\_DISABLE\_FEATURE is assigned to parameter **wAvTriCfg**.

ERROR\_T\_AVOID\_TRIANGLE\_SET: Cannot set the avoid-triangle feature, please call GetLastError() for further system information.

## 8.3 i8094\_change\_p

short i8094\_change\_p(BYTE bSlotNum, WORD wAxis, DWORD dwP)

### Description:

This function changes the total numbers of output pulse during moving.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

dwP: The total numbers of output pulse.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_CONFLICT\_WITH\_INTERPOLATION\_MOVE: Indicates the finish-point of interpolation moving cannot be changed dynamically.

ERROR\_OUTPUT\_PULSE\_CHANGE: Cannot change total number of output pulse, please call GetLastError() for further system information.



## 8.4 i8094\_set\_cmdcounter

short i8094\_set\_cmdcounter(BYTE bSlotNum, WORD wAxis, long lData)

### Description:

This function set the logic-command counter.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

lData: The value to be set to logic-command counter.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_CMD\_COUNTER\_SET: Cannot set the logic-command counter, please call GetLastError() for further system information.

## 8.5 i8094\_set\_enccounter

short i8094\_set\_enccounter(BYTE bSlotNum, WORD wAxis, DWORD IData)

### Description:

This function set the encoder-counter.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

IData: The value to be set to encoder-position counter.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_POS\_COUNTER\_SET: Cannot set the encoder-position counter, please call GetLastError() for further system information.

## Status

This chapter introduces functions to get the status of i-8094 module, including `i8094_motion_done()`, `i8094_get_cmdcounter()`, `i8094_get_position()`, `i8094_get_speed()`, `i8094_get_acc()`, `i8094_get_latch()`, `i8094_get_mdi_status()`, `i8094_get_in3()`, `i8094_get_int_status()` and `i8094_get_error_status()`.

### 9.1 i8094\_motion\_done

short `i8094_motion_done`(BYTE `bSlotNum`, WORD `wAxis`, BYTE\* `pDone`, WORD\* `pStopStatus`)

**Description:**

This function checks the completion of motion and reports the cause of motion-completion.

**Parameters:**

`bSlotNum`: The specific slot number that i-8094 installed on.

`wAxis`: can be one of `AXIS_X`, `AXIS_Y`, `AXIS_Z` or `AXIS_U`.

`pDone`: The pointer to the memory that stores the motion-status. The motion-status will be

`MOTION_DONE`: the specific axis is stop.

`MOTION_NOT_DONE`: the specific axis is driving.

`pStopStatus`: The pointer to the memory that stores the cause of motion-completion, including

`DRIVE_FINISH_WITH_SW_LIMIT_POSITIVE`: reaches software limit in forward direction and stops

`DRIVE_FINISH_WITH_SW_LIMIT_NEGATIVE`: reaches software limit in reverse direction and stops

`DRIVE_FINISH_WITH_STOP_COMMAND`: the stop command is executed.

`DRIVE_FINISH_OUTPUT_FIXED_PULSE`: completion of fixed-pulse moving.

`DRIVE_FINISH_WITH_AUTO_HOME`: completion of automatic-home-search.

`DRIVE_FINISH_WITH_LIMIT_POSITIVE`: reaches hardware limit in forward direction and stops

DRIVE\_FINISH\_WITH\_LIMIT\_NEGATIVE: reaches hardware limit in reverse direction and stops

DRIVE\_FINISH\_WITH\_ALARM: the ALARM feature is enabled and is active to stop driving.

DRIVE\_FINISH\_WITH\_EMG: the driving is stopped when EMG is active.

**Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_MOTION\_DONE\_GET: Cannot get motion status, please call GetLastError() for further system information.

## 9.2 i8094\_get\_cmdcounter

short i8094\_get\_cmdcounter(BYTE bSlotNum, WORD wAxis, long\* pData)

### Description:

This function gets the content of logic-command counter.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pData: The pointer to the memory that stores logic-command counter.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_CMD\_COUNTER\_GET: Cannot get the logic-command counter, please call GetLastError() for further system information.

## 9.3 i8094\_get\_enccounter

short i8094\_get\_enccounter(BYTE bSlotNum, WORD wAxis, long\* pData)

### Description:

This function gets the content of encoder-counter.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pData: The pointer to the memory that stores encoder-position counter.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_POS\_COUNTER\_GET: Cannot get the encoder-position counter, please call GetLastError() for further system information.

## 9.4 i8094\_get\_speed

short i8094\_get\_speed(BYTE bSlotNum, WORD wAxis, DWORD\* pSpeed)

### Description:

This function gets the speed of current motion.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pSpeed: The pointer to the memory that stores speed of current motion.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_SPEED\_GET: Cannot get the current speed, please call GetLastError() for further system information.

## 9.5 i8094\_get\_acc

short i8094\_get\_acc(BYTE bSlotNum, WORD wAxis, DWORD\* pAcc)

### Description:

This function gets the acceleration of current motion.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pAcc: The pointer to the memory that stores acceleration of current motion.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_ACCELERATION\_GET: cannot get the current acceleration, please call GetLastError() for further system information.



## 9.6 i8094\_get\_latch

short i8094\_get\_latch(BYTE bSlotNum, WORD wAxis, long\* pLatchData)

### Description:

This function gets the content of **Buffer** register.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pLatchData: The pointer to the memory that stores data latched in **Buffer** register. Please refer to i8094\_set\_synch() for to latched data into **Buffer** register.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_LATCH\_GET: Cannot get the latched data, please call GetLastError() for further system information.

## 9.7 i8094\_get\_mdi\_status

short i8094\_get\_mdi\_status(BYTE bSlotNum, WORD wAxis, WORD\* pDIStatus)

### Description:

This function checks the status of motion-related digital inputs.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pDIStatus: The pointer to the memory that stores the motion-related digital inputs. The value stored in this parameter may be the combination of following status:

DI\_STATUS\_ACTIVE\_DRIVING: indicates the specific axis is driving.

DI\_STATUS\_ACTIVE\_LMTP: the hardware limit in forward direction is active.

DI\_STATUS\_ACTIVE\_LMTM: the hardware limit in reverse direction is active.

DI\_STATUS\_ACTIVE\_EMG: the EMG signal is active.

DI\_STATUS\_ACTIVE\_ALARM: the ALARM signal is enabled and active.

DI\_STATUS\_ACTIVE\_HOME: the Home (ORG) signal is active.

DI\_STATUS\_ACTIVE\_NEARHOME: the Near-Home (NORG) signal is active.

DI\_STATUS\_ACTIVE\_INP: the INP signal is enabled and active.

DI\_STATUS\_ACTIVE\_INDEX: The Z-Phase/INDEX signal is active.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_DI\_STATUS\_GET Cannot get motion-related digital inputs, please call GetLastError() for further system information.

## 9.8 i8094\_get\_in3

short i8094\_get\_in3(BYTE bSlotNum, WORD wAxis, BYTE\* pIN3Status)

### Description:

This function gets the status of digital input **IN3**.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pIN3Status: The pointer to the memory that stores the input of IN3. The value stored in this parameter will be 0x01 or 0x00.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_IN3\_GET: Cannot get the digital input **IN3**, please call GetLastError() for further system information.

## 9.9 i8094\_get\_int\_status

short i8094\_get\_int\_status(BYTE bSlotNum, WORD wAxis, WORD\* plntStatus)

### Description:

This function gets the status of interrupt factors.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

plntStatus: The pointer to the memory that stores the status of interrupt factors, including

INT\_STATUS\_EXCEED\_CMP\_NEGATIVE,  
INT\_STATUS\_LESS\_CMP\_NEGATIVE,  
INT\_STATUS\_LESS\_CMP\_POSITIVE,  
INT\_STATUS\_EXCEED\_CMP\_POSITIVE,  
INT\_STATUS\_END\_CONST\_SPEED\_MOVE,  
INT\_STATUS\_START\_CONST\_SPEED\_MOVE,  
INT\_STATUS\_END\_DRIVING

Please refer to i8094\_set\_int\_factor() for the setting of relative interrupt factors.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_INT\_STATUS\_GET: Cannot get the status of interrupt, please call GetLastError() for further system information.

## 9.10 i8094\_get\_error\_status

short i8094\_get\_error\_status(BYTE bSlotNum, WORD wAxis, WORD\* pErrorStatus)

### Description:

This function gets the error-status of specific axis.

### Parameters:

bSlotNum: The specific slot number that i-8094 installed on.

wAxis: Can be one of AXIS\_X, AXIS\_Y, AXIS\_Z or AXIS\_U.

pErrorStatus: The pointer to the memory that stores the error status, including

DRIVE\_ERROR\_STATUS\_SLMTTP: error caused by software limit in forward direction.

DRIVE\_ERROR\_STATUS\_SLMTM: error cause by software limit in reverse direction.

DRIVE\_ERROR\_STATUS\_LMTTP: error caused by hardware limit in forward direction.

DRIVE\_ERROR\_STATUS\_LMTM: error caused by hardware limit in reverse direction.

DRIVE\_ERROR\_STATUS\_ALARM: error caused by ALARM signal.

DRIVE\_ERROR\_STATUS\_EMG: error caused by EMG signal.

DRIVE\_ERROR\_STATUS\_HOME: error caused by execution of automatic-home-search.

The Z-Phase/INDEX is already active at the start of Automatic-Home-Search Step-3.

Please refer to i8094\_set\_home\_cfg() for detailed information.

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_MULTI\_AXES\_ASSIGNED: Multiple axes are assigned to parameter **wAxis**.

ERROR\_NO\_VALID\_AXIS\_ASSIGNED: No valid axis ID is assigned to parameter **wAxis**.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_ERROR\_STATUS\_GET: Cannot get the error status, please call GetLastError() for further system information.

## FRnet I/O extension

The I-8094F equips the FRnet ASIC to connect the remote FRnet I/O extension. The FRnet ASIC provides the real-time status-updating of its remote I/O modules. This chapter introduces the FRnet functions, including `i8094_get_FRnet_DI()` and `i8094_set_FRnet_DO()`.

### 10.1 i8094\_get\_FRnet\_DI

```
short i8094_get_FRnet_DI(BYTE bSlotNum, WORD wSA, WORD *pStatus, WORD
wEnableDirectAccess = FRNET_ENABLE_DIRECT_ACCESS)
```

**Description:**

This function get the digital-inputs of *FRnet* DI module.

**Parameters:**

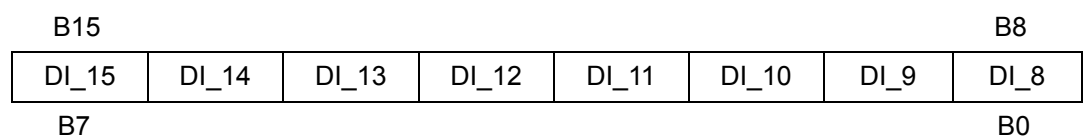
`bSlotNum`: The specific slot number that i-8094F installed on.

`wSA`: The Group-Address of *FRnet* DI module. One of following Group-Address can be assigned to

this parameter:

FRNET\_SA8,  
FRNET\_SA9,  
FRNET\_SA10,  
FRNET\_SA11,  
FRNET\_SA12,  
FRNET\_SA13,  
FRNET\_SA14,  
FRNET\_SA15.

`pStatus`: The pointer to the WORD that indicates each digital-input of *FRnet* DI module.



DI_7	DI_6	DI_5	DI_4	DI_3	DI_2	DI_1	DI_0
------	------	------	------	------	------	------	------

wEnableDirectAccess: Now only FRNET\_ENABLE\_DIRECT\_ACCESS is valid.

**Return Code:**

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_INVALID\_FRNET\_ACCESS\_MODE: Not FRNET\_ENABLE\_DIRECT\_ACCESS is assigned to parameter **wEnableDirectAccess**.

ERROR\_INVALID\_FRNET\_SA\_GROUP\_ADDRESS: Indicates the invalid Group-Address of *FRnet* DI module is assigned to parameter **wSA**.

ERROR\_UNSUPPORTED\_FUNCTION : Indicate this function does not support i-8094 module.

ERROR\_ACCESS\_VIOLATION\_DATA\_COPY: Some system exception occurs while copying memory, please check the pointer-type parameter you assign to this function.

ERROR\_FRNET\_INPUT: Cannot get the digital-inputs of *FRnet* DI module, please call GetLastError() for further system information.

## 10.2 i8094\_set\_FRnet\_DO

short i8094\_set\_FRnet\_DO(BYTE bSlotNum, WORD wRA, WORD wDOData)

### Description:

This function set the digital-outputs of *FRnet* DO module.

### Parameters:

bSlotNum: The specific slot number that i-8094F installed on.

wRA: The Group-Address of *FRnet* D0 module. One of following Group-Address can be assigned to this parameter:

FRNET\_RA0,  
FRNET\_RA1,  
FRNET\_RA2,  
FRNET\_RA3,  
FRNET\_RA7,  
FRNET\_RA5,  
FRNET\_RA6,  
FRNET\_RA7.

wDOData: The 16-bits data to be set to *FRnet* DO module.

B15						B8	
DO_15	DO_14	DO_13	DO_12	DO_11	DO_10	DO_9	DO_8
B7						B0	
DO_7	DO_6	DO_5	DO_4	DO_3	DO_2	DO_1	DO_0

### Return Code:

SUCCESS\_NO\_ERROR: The function returns successfully.

ERROR\_INVALID\_CARD\_ID: There is no active i-8094 module on the given slot, bSlotNum; or the given slot-number is invalid (for instance, slot-number is assigned to 254).

ERROR\_INVALID\_FRNET\_RA\_GROUP\_ADDRESS: Indicates the invalid Group-Address of *FRnet* DO module is assigned to parameter **wRA**.

ERROR\_UNSUPPORTED\_FUNCTION : Indicate this function does not support i-8094 module.

ERROR\_FRNET\_OUTPUT: Cannot set the digital-outputs of *FRnet* DO module, please call GetLastError() for further system information.



## Error Code

The Error Codes are divided into three parts: System Error, Parameter Error and Runtime Error.

SUCCESS\_NO\_ERROR 0

### System Error:

ERROR_ROUTINE_FAIL_BASE	-100
ERROR_GET_MODULE_ID	-101
ERROR_DEVICE_OPEN	-102
ERROR_DEVICE_CLOSE	-103
ERROR_MODULE_RESET	-104
ERROR_RANGE_CHANGE	-105
ERROR_PULSE_MODE_SET	-106
ERROR_ENCODER_MODE_SET	-107
ERROR_LIMIT_SENSOR_SET	-108
ERROR_INP_SIGNAL_SET	-109
ERROR_ALARM_SIGNAL_SET	-110
ERROR_SERVO_ON_SET	-111
ERROR_IN3_SET	-112
ERROR_IN3_GET	-113
ERROR_FILTER_SET	-114
ERROR_SW_LIMIT_SET	-115
ERROR_HOME_CFG_SET	-116
ERROR_HOME_LIMIT_SET	-117
ERROR_START_HOME	-118
ERROR_DI_STATUS_GET	-119
ERROR_ERROR_STATUS_GET	-120
ERROR_CMD_COUNTER_SET	-121
ERROR_CMD_COUNTER_GET	-122
ERROR_POS_COUNTER_SET	-123

ERROR_POS_COUNTER_GET	-124
ERROR_MOTION_DONE_GET	-125
ERROR_SPEED_GET	-126
ERROR_ACCELERATION_GET	-127
ERROR_LATCH_GET	-128
ERROR_MOTION_STOP_SET	-129
ERROR_MOTION_STOP_ALL_SET	-130
ERROR_DRIVE_START	-131
ERROR_DRIVE_HOLD	-132
ERROR_VRING_SET	-133
ERROR_MPG_SET	-134
ERROR_CMPTRIG_SET	-135
ERROR_SYNCH_SET	-136
ERROR_INT_FACTOR_SET	-137
ERROR_INT_STATUS_GET	-138
ERROR_CONTI_MOVE_START	-139
ERROR_CONST_MOVE_START	-140
ERROR_T_MOVE_START	-141
ERROR_S_MOVE_START	-142
ERROR_T_LINE2_START	-143
ERROR_T_LINE3_START	-144
ERROR_S_LINE2_START	-145
ERROR_S_LINE3_START	-146
ERROR_T_ARC2_START	-147
ERROR_CONTI_INTERP_SET	-148
ERROR_CONTI_INTERP_CLEAR	-149
ERROR_CONTI_INTERP_NEXT_READY	-150
ERROR_CONTI_INTERP_LINE2_MOVE	-151
ERROR_CONTI_INTERP_LINE3_MOVE	-152
ERROR_CONTI_INTERP_ARC2_MOVE	-153
ERROR_T_DRIVING_SPEED_CHANGE	-154
ERROR_T_AVOID_TRIANGLE_SET	-155
ERROR_OUTPUT_PULSE_CHANGE	-156
ERROR_OUT1_GET	-157
ERROR_FRNET_DI_MODULE_GET	-158
ERROR_FRNET_FREQUENCY_SET	-159
ERROR_FRNET_INPUT	-160
ERROR_FRNET_OUTPUT	-161

ERROR\_FRNET\_RESET -162

Parameter Error:

ERROR\_INVALID\_PARAMETER\_BASE -200  
ERROR\_INVALID\_CARD\_ID -201  
ERROR\_INVALID\_SCANNED\_INDEX -202  
ERROR\_MODULE\_ID\_DUPLICATED -203  
ERROR\_INVALID\_RANGE -204  
ERROR\_INVALID\_PULSE\_MODE -205  
ERROR\_INVALID\_PULSE\_LEVEL -206  
ERROR\_INVALID\_PULSE\_DIRECTION -207  
ERROR\_INVALID\_ENCODER\_MODE -208  
ERROR\_INVALID\_LIMIT\_LOGIC -209  
ERROR\_INVALID\_STOP\_MODE -210  
ERROR\_INVALID\_INP\_ENABLE -211  
ERROR\_INVALID\_INP\_LOGIC\_LEVEL -212  
ERROR\_INVALID\_ALARM\_ENABLE -213  
ERROR\_INVALID\_ALARM\_LOGIC\_LEVEL -214  
ERROR\_INVALID\_SERVO\_SETTING -215  
ERROR\_INVALID\_IN3\_ENABLE -216  
ERROR\_INVALID\_IN3\_LOGIC\_LEVEL -217  
ERROR\_INVALID\_FILTER\_ENABLE -218  
ERROR\_INVALID\_FILTER\_CONFIGURATION -219  
ERROR\_INVALID\_FILTER\_DELAY\_TIME -220  
ERROR\_INVALID\_SOFTWARE\_LIMIT\_ENABLE -221  
ERROR\_INVALID\_SOFTWARE\_LIMIT\_COMPARATOR\_SOURCE -222  
ERROR\_INVALID\_MOVE\_DIRECTION -223  
ERROR\_INVALID\_HOME\_LOGIC\_LEVEL -224  
ERROR\_INVALID\_NEAR\_HOME\_LOGIC\_LEVEL -225  
ERROR\_INVALID\_INDEX\_LOGIC\_LEVEL -226  
ERROR\_INVALID\_AUTO\_HOME\_STEP -227  
ERROR\_INVALID\_BLOCK\_OPEARTION\_MODE -228  
ERROR\_INVALID\_AVOID\_TRIANGLE\_CONFIG -229  
ERROR\_INVALID\_MPG\_EXP\_CONFIG -230  
ERROR\_INVALID\_NHOME\_SEARCH\_SPEED -231  
ERROR\_INVALID\_HOME\_SEARCH\_SPEED -232  
ERROR\_INVALID\_ACCELERATION -233  
ERROR\_INVALID\_DECELERATION -234

ERROR_INVALID_JERK	-235
ERROR_INVALID_DECELERATION_RATE	-236
ERROR_INVALID_RING_COUNTER	-237
ERROR_INVALID_RING_ENABLE	-238
ERROR_INVALID_AXIS	-239
ERROR_INVALID_CONST_PITCH	-240
ERROR_INVALID_OFFSET_BUFFER	-241
ERROR_INVALID_OFFSET_LEN	-242
ERROR_INVALID_OFFSET_DATA	-243
ERROR_INVALID_START_SPEED	-244
ERROR_INVALID_DRIVING_SPEED	-245
ERROR_INVALID_MANUAL_DECELERATION_POINT	-246
ERROR_START_SPEED_EXCEED_DRIVING_SPEED	-247
ERROR_MULTI_AXES_ASSIGNED	-248
ERROR_NO_VALID_AXIS_ASSIGNED	-249
ERROR_INVALID_INTERPOLATION_SLAVE_AXES	-250
ERROR_INTERPOLATION_SLAVE_AXES_DUPLICATED	-251
ERROR_INVALID_SYNCHRONOUS_AXES	-252
ERROR_INVALID_INTERPOLATION_ARC_DIRECTION	-253
ERROR_INVALID_CONTINUE_INTERPOLATION_MOTION	-254
ERROR_INVALID_FRNET_PERIODIC_ENABLE	-255
ERROR_INVALID_FRNET_PERIODIC_FACTOR	-256
ERROR_INVALID_FRNET_SA_GROUP_ADDRESS	-257
ERROR_INVALID_FRNET_RA_GROUP_ADDRESS	-258
ERROR_INVALID_FRNET_ACCESS_MODE	-259
ERROR_INVALID_COMPARE_SOURCE	-260
ERROR_INVALID_MPG_SPEED	-261
ERROR_INVALID_CMPTRIG_ENABLE	-262
ERROR_INVALID_CMPTRIG_TRIGGER_MODE	-263
ERROR_INVALID_CMPTRIG_LOGIC_LEVEL	-264
ERROR_INVALID_CMPTRIG_PULSE_WIDTH	-265
ERROR_INVALID_SYNCH_ENABLE	-266
ERROR_INVALID_SYNCH_CONDITION	-267
ERROR_INVALID_SYNCH_ACTION	-268
ERROR_INVALID_EVENT_ENABLE	-269
ERROR_INVALID_INT_FACTOR	-270

Runtime Error:

ERROR_RUNTIME_BASE	-300
ERROR_OCCURS_IN_AXIS_X	-301
ERROR_OCCURS_IN_AXIS_Y	-302
ERROR_OCCURS_IN_AXIS_XY	-303
ERROR_OCCURS_IN_AXIS_Z	-304
ERROR_OCCURS_IN_AXIS_XZ	-305
ERROR_OCCURS_IN_AXIS_YZ	-306
ERROR_OCCURS_IN_AXIS_XYZ	-307
ERROR_OCCURS_IN_AXIS_U	-308
ERROR_OCCURS_IN_AXIS_XU	-309
ERROR_OCCURS_IN_AXIS_YU	-310
ERROR_OCCURS_IN_AXIS_XYU	-311
ERROR_OCCURS_IN_AXIS_ZU	-312
ERROR_OCCURS_IN_AXIS_XZU	-313
ERROR_OCCURS_IN_AXIS_YZU	-314
ERROR_OCCURS_IN_AXIS_XYZU	-315
ERROR_NO_MODULE_FOUND	-316
ERROR_MEMORY_MAP	-317
ERROR_MEMORY_UNMAP	-318
ERROR_ACCESS_VIOLATION_DATA_COPY	-319
ERROR_VARIABLE_PITCH_SET	-320
ERROR_INT_EVENT_ATTACH	-321
ERROR_INT_EVENT_DETACH	-322
ERROR_INT_EVENT_CREATE	-323
ERROR_CONFIG_IS_NEEDED	-324
ERROR_MOTION_NOT_COMPLETE	-325
ERROR_CONFLICT_WITH_SOFTLIMIT	-326
ERROR_CONFLICT_WITH_CMPTRIG	-327
ERROR_CONFLICT_WITH_VRING	-328
ERROR_CONFLICT_WITH_SYNCH_ACTION	-329
ERROR_ARC_DECELERATION_POINT_CALCULATE	-330
ERROR_REASSIGN_SYNCH_MODE_COMMAND	-331
ERROR_OVERLAP_EVENT_CREATE	-332
ERROR_INTERPOLATION_NOT_COMPLETE	-333
ERROR_CONTI_INTERP_INTERRUPTED	-334
ERROR_CONTI_INTERP_INCORRECT_CONFIG	-335
ERROR_CONTI_INTERP_NEXT_NOT_READY	-336
ERROR_SPEED_CHANGE_FAIL_IN_ACC_DEC	-337

ERROR_INVALID_OPERATION_IN_S_CURVE	-338
ERROR_NOT_CONSTANT_SPEED_IN_T_MOVE	-339
ERROR_MOTION_IS_COMPLETED	-340
ERROR_CONFLICT_WITH_INTERPOLATION_MOVE	-341
ERROR_HOLD_AXES_NOT_MATCH	-342
ERROR_BLOCK_OP_CONFLICT_WITH_CMPTRIG	-343
ERROR_CONFLICT_WITH_MPG	-344
ERROR_HOLD_AXES_NOT_RELEASE	-345
ERROR_ZPHASE_ACTIVE_AT_STEP3	-346
ERROR_BLOCK_OP_CONFLICT_WITH_DRV_HOLD	-347
ERROR_AXES_MOVE_CHECK	-360
ERROR_IOCTL_FAILED	-361
ERROR_UNDEFINED_EXCEPTION	-362
ERROR_CONFIG_FILE_LOAD	-370
ERROR_CONFLICT_IN_CONFIG_FILE	-371
ERROR_INVALID_FILE_HANDLE	-372
ERROR_ACCESS_REGISTRY_ACTIVE_ROOT	-375
ERROR_ACCESS_REGISTRY_ACTIVE_NUMBER	-376
ERROR_UNSUPPORTED_FUNCTION	-380