

# FDK API Manual for C

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# FN Pricing

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# Overview

---

This document is the API specification for C of the CallFDK

The CallFDK is the API Library for using FDK engine provided by ITS

## System Environments

---

C compilers

## Installation files

---

Linux

- callfdk shared object binary
  - libcallfdk.so
  - libcallfdk\_dat.so
  - libxerces-c\*
- callfdk header files/callfdk\_c.h, svcxxxx.h ...
- MsgDic.xml : FDK SService Message Dictionary file
- UserKey.lic : API identification key file
- callfdk.cfg : CallFDK API configuration file
- test\_main.c : sample program source file
- Makefile : sample make file

## Runtime Environments

---

Register the directory which the CallFDK API library is installed at LD\_LIBRARY\_PATH.

**Linux/Unix**

```
$ export LD_LIBRARY_PATH=/path/to/lib:$LD_LIBRARY_PATH
```

## Sample codes for using CallFDK API

---

**Example : test\_main.c**

```
#include <stdio.h>
#include "callfdk_c.h"

#include "svc2106.h"
```

```

int
main()
{
    CallFdk_Error tError;
    TMsg *pIn = NULL;
    TMsg *pOut = NULL;
    TMsg *pSub = NULL;
    TMsg *pAmort = NULL;
    int i;
    int iRet;
    int iArrSize;
    char *sBuf = NULL;
    double dVal;

    /* init CallFdk API */
    iRet = CallFdk_Initialize("callfdk.cfg", &tError);
    if (iRet < 0) {
        printf("Error: %s\n", tError.sErrText);
        return -1;
    }

    /*new & set Input message */
    pIn = MSG_GetNewMsg(MSG_IrNoteVanilla, &tError);
    if (pIn == NULL) {
        printf("Error: pIn: %s\n", tError.sErrText);
        return -1;
    }
    pSub = MSG_GetNewMsg(MSG_IrNotionalInfo, &tError);
    if (pSub == NULL) {
        printf("Error: pSub: %s\n", tError.sErrText);
        return -1;
    }
    iRet = MSG_SetDbl(pSub, TAG_dNotionAmt, 100000);
    if (iRet < 0) {
        printf("Error: %s\n", MSG_GetLastError(pSub));
        MSG_Destroy(pIn);
        MSG_Destroy(pSub);
        return -1;
    }
    iRet = MSG_SetStr(pSub, TAG_sCcy, "USD");
    if (iRet < 0) {
        printf("Error: %s\n", MSG_GetLastError(pSub));
        MSG_Destroy(pIn);
        MSG_Destroy(pSub);
        return -1;
    }
    for (i = 0; i < 3; i++) {
        pAmort = MSG_GetNewMsg(MSG_IrAmortSchedule, &tError);
        if (pAmort == NULL) {
            printf("Error: pAmort: %s\n", tError.sErrText);
            MSG_Destroy(pIn);
            MSG_Destroy(pSub);
            MSG_Destroy(pAmort);
            return -1;
        }
        iRet = MSG_SetInt(pAmort, TAG_iPeriodNo, i+1);
        if (iRet < 0) {
            printf("Error: %s\n", MSG_GetLastError(pSub));

```

```

        MSG_Destroy(pIn);
        MSG_Destroy(pSub);
        MSG_Destroy(pAmort);
        return -1;
    }
    iRet = MSG_SetDbl(pAmort, TAG_dAmortAmt, 3.14 * i);
    if (iRet < 0) {
        printf("Error: %s\n", MSG_GetLastError(pSub));
        MSG_Destroy(pIn);
        MSG_Destroy(pSub);
        MSG_Destroy(pAmort);
        return -1;
    }
    iRet = MSG_SetSub(pSub, TAG_maIrAmortSchedule, pAmort);
    if (iRet < 0) {
        printf("Error: %s\n", MSG_GetLastError(pSub));
        MSG_Destroy(pIn);
        MSG_Destroy(pSub);
        MSG_Destroy(pAmort);
        return -1;
    }
}
iRet = MSG_SetSub(pIn, TAG_mIrNotionalInfo, pSub);
if (iRet < 0) {
    printf("Error: %s\n", MSG_GetLastError(pSub));
    MSG_Destroy(pIn);
    MSG_Destroy(pSub);
    return -1;
}

/* prepare output message */
pOut = MSG_GetNewMsg(MSG_IrNoteOut, &tError);
if (pOut == NULL) {
    printf("Error: pOut: %s\n", tError.sErrText);
    MSG_Destroy(pIn);
    return -1;
}

/* call service */
iRet = CallFdk_CallService(2106, pIn, pOut, &tError);
if (iRet < 0) {
    printf("Error: %s\n", tError.sErrText);
    MSG_Destroy(pIn);
    MSG_Destroy(pOut);
    return -1;
}
MSG_Destroy(pIn);

/* refer to output message */
iArrSize = MSG_GetArrSize(pOut, TAG_maIrNotePrice);
for (i = 0; i < iArrSize; i++) {
    pSub = MSG_GetAtSubArr(pOut, TAG_maIrNotePrice, i, &iRet);
    if (pSub == NULL) {
        printf("Error: %s\n", MSG_GetLastError(pOut));
        MSG_Destroy(pOut);
        return -1;
    }
    sBuf = MSG_GetStrEx(pSub, TAG_sPriceType, &iRet);
    if (sBuf == NULL) {

```

```

        printf("Error: %s\n", MSG_GetLastError(pSub));
        MSG_Destroy(pOut);
        return -1;
    }
    printf("maIrNotePrice[%d].sPriceType : %s\n", i, sBuf);
    free(sBuf);
    iRet = MSG_GetDbl(pSub, TAG_dDirtyPrice, &dVal);
    if (iRet < 0) {
        printf("Error: %s\n", MSG_GetLastError(pSub));
        MSG_Destroy(pOut);
        return -1;
    }
    printf("maIrNotePrice[%d].dDirtyPrice : %e\n", i, dVal);

}
MSG_Destroy(pOut);

return 0;
}

```

1. Include service header file(svc####.h)
2. Call CallFdk\_Initialize()
3. Make new input message and setting data(pIn)
4. Call CallFdk\_CallService()
5. Use output message data
6. Destroy message instances(pIn, pOut)

# CallFdk functions

---

These functions are used for calling the service of FDK engine

## int CallFdk\_Initialize(...)

---

### Description

This function is used to initialize the CallFDK API library with a given configuration file. This function must be called only once in the entire program.

### Parameters

- const char \*p\_szCfgFile : Configuration file path
- CallFdk\_Error \*p\_pError : CallFdk\_Error structure

### Return : int

If this return value is less than zero, it means that an error occurs in this function call.

If an error occurs in this function, the reason of error is stored in CallFdk\_Error instance

### Example

```
CallFdk_Error tError;
iRet = CCallFdk::Initialize("/path/to/callfdk.cfg", &tError);
if (iRet < 0) {
    printf("Error: %s\n", tError.szErrText);
    return -1;
}
```

### Configuration file sample

```
key_file=UserKey.lic
msg_dic=MsgDic.exml
server=sq.fnpricing.com 5300
timeout=90
```

key\_file and msg\_dic keywords both in full or relative path can be expressed.

## int CallFdk\_InitializeEx(...)

---

### Description

This function is the alternatives of the previous CallFdk\_Initialize() function. This is used to initialize the CallFDK API library with each argument. This function must also be called only once in the entire program.

### Parameters

- const char \*p\_szKeyFile : API identification key file path
- const char \*p\_szDicFile : FDK Service Message Dictionary file path
- const char \*p\_szServer : FDK server address(DNS name or IP address)
- int p\_iPort : FDK server port number



- int p\_iTimeout : timeout(seconds) which the API waits for the response of the FDK server
- CallFdk\_Error \*p\_pError : CallFdk\_Error instance for error

**Return : int**

If this value is less than zero, an error occurs in the function call. The reason of error is stored in CallFdk\_Error instance.

**Example**

```
CallFdk_Error tError;
iRet = CCallFdk::InitializeEx("/path/to/UserKey.lic",
    "/path/to/MsgDic.exml", "sq.fnpricing.com", 5300, 90, &tError);
if (iRet < 0) {
    printf("Error: %s\n", tError.szErrText);
    return -1;
}
```

## int CallFdk\_CallService(...)

---

**Description**

This function is used to call service corresponding to p\_iSvcNum with input message(p\_pIn) instance. The response from the FDK engine is stored in output message(p\_pOut) instance. Input and Output message pointer must be allocated by MSG\_GetNewMsg() function before calling this function.

**Parameters**

- int p\_iSvcNum : Service number
- TMsg \*p\_pIn : Input message instance
- TMsg \*p\_pOut : Output message instance
- CallFdk\_Error \*p\_pError : CallFdk\_Error instance

For the service number, input message and output message, refer to FDK Service Message Reference Manual

**Return : int**

If this return value is less than zero, an error occurs in this function call. The reason of error is stored in CallFdk\_Error instance

**Example**

```
TMsg *pIn = NULL;
TMsg *pOut = NULL;

pIn = MSG_GetNewMsg(MSG_IrNoteVanilla);
if (pIn == NULL) {
    printf("Error: pOut\n");
    MSG_Destroy(pIn);
    return -1;
}
/* MSG_Setxxx() setting */
/* ... */
```

```

pOut = MSG_GetNewMsg(MSG_IrNoteOut);
if (pIn == NULL) {
    printf("Error: pOut\n");
    MSG_Destroy(pIn);
    return -1;
}

iRet = CallFdk_CallService(2106, pIn, pOut, &tError);
if (iRet < 0) {
    printf("Error: %s\n", tError.szErrText);
    return -1;
}
...

```

## CallFdk\_Error structure

This structure is used to handle errors occurring when CallFdk\_\* functions are called.

In case CallFdk\_CallService(), this structure has the error from the FDK engine

```

typedef struct {
    int iCode;
    char sErrText[1024];
    int iRefSvcNum;
} CallFdk_Error;

```

- int iCode : Error Code
- char szErrText[] : Error Text
- int iRefSvcNum : Service number or message number for referring to this error

## Service / Message

---

### Service

---

The Service is a basic unit of the transaction with the FDK engine. This is represented by the service number. Services are classified by the product type, the algorithm and the feature in detail. Refer to Service Message Reference Manual.

### Message Object

---

The Message Object is a basic unit of the data block which the CallFDK API exchanges with the FDK server. This is divided into two objects such as the request and the response message.

Input message : the data which the API sends to the FDK server.

Output message : the data which the API receives from the FDK server.

Each Message Object can hold other message object as sub message.

## The Structure of Message Object

---

The Message Object can hold the data types as following.

Data Type	C Type	Getting Data	Setting Data	prefix	TAG_* example
string	char *	MSG_GetStr	MSG_SetStr	s	TAG_sCcy
integer	int	MSG_GetInt	MSG_SetInt	i	TAG_iPeriodNo
double	double	MSG_GetDbl	MSG_SetDbl	d	TAG_dFixedRate
boolean	int	MSG_GetBool	MSG_SetBool	b	TAG_bDiffYN
date(YYYYMMDD)	char[9]	MSG_GetDate	MSG_SetDate	n	TAG_nDate
sub message	TMsg *	MSG_GetSub	MSG_SetSub	m	TAG_mIrVanilla
string array	char *	MSG_GetAtStrArr	MSG_SetStr	sa	TAG_saCode
integer array	int	MSG_GetAtIntArr	MSG_SetInt	ia	TAG_iaSeqNum
double array	double	MSG_GetAtDblArr	MSG_SetDbl	da	TAG_daPrice
boolean array	int	MSG_GetAtBoolArr	MSG_SetBool	ba	TAG_baCallYN
date array	char[9]	MSG_GetAtDateArr	MSG_SetDate	na	TAG_naCpnDate
sub message array	TMsg *	MSG_GetAtSubArr	MSG_SetSub	ma	TAG_maNoteCF

The functions which are written in the above table are used to set or get data with message object. The message object can have other messages as sub messages. The service numbers, message numbers and tag numbers are defined in the svc####.h file. The message names and the tag names can be referred to Service Message Reference Manual.

## Message Getting/Setting functions

---

This section explains about how to create and delete message object, how to set and get data from message object.

TMsg \*MSG\_GetNewMsg(int p\_iMsgNum, CallFdk\_Error \*p\_pError)

---

### Description

This function is used to create new message instance by the given message number(p\_iMsgNum). The message number is predefined at svc####.h. For more information about message number, refer to FDK Service Message Manual.

### Parameters

- int p\_iMsgNum : message number
- CallFdk\_Error \*p\_pError : CallFdk\_Error structure

### Return : TMsg \*

The pointer to the newly created message instance

### Example

```

TMsg *pMsg = NULL;
CallFdk_Error tError;
pMsg = MSG_GetNewMsg(MSG_IrNoteVanilla, &tError);
if (pMsg == NULL) {
    printf("Error: MSG_GetNewMsg failed(%s)\n", tError.sErrText);
    return -1;
}

```

void MSG\_Destroy(TMsg \*p\_pMsg)

---

### Description

This function is used to destroy the given message instance. The message instance which is created by MSG\_GetNewMsg() must be destroyed by this function. Otherwise, memory leak may occur. But if the message instance which is created by MSG\_GetNewMsg() is used as sub message, you don't have to destroy it. The message instances which are used as sub message are destroyed automatically when the parent message is destroyed.

### Parameters

- TMsg \*p\_pMsg : message instance pointer

### Example

```

TMsg *pMsg = NULL;
CallFdk_Error tError;
pMsg = MSG_GetNewMsg(MSG_IrNoteVanilla, &tError);
if (pMsg == NULL) {

```

```

printf("Error: MSG_GetNewMsg failed(%s)\n", tError.sErrText);
return -1;
}
...
MSG_Destroy(pMsg);

```

## char \*MSG\_GetLastError(TMsg \*p\_pMsg)

---

### Description

This function is used to get what kind of error occurs when the message functions are failed. The message functions return negative value when they failed.

### Parameters

- TMsg \*p\_pMsg : message instance pointer

### Return : char \*

Error text string. This pointer does not have to be freed.

### Example

```

int iRet;
...
iRet = MSG_SetStr(pMsg, TAG_sCcy, "USD");
if (iRet < 0) {
    printf("Error: MSG_SetStr failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}

```

## int MSG\_Dump(TMsg \*p\_pMsg, const char \*p\_sFileName, CallFdk\_Error \*p\_pError)

---

### Description

This function is used to dump the data which the given messages are hold.

If the p\_sFileName is NULL, the function dumps data to the standard output, otherwise writes data to the given file. This is usually used for debugging.

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- const char \*p\_sFileName : filename path
- CallFdk\_Error \*p\_pError : CallFdk\_Error structure

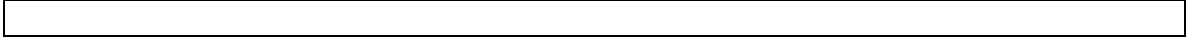
### Example

```

...
MSG_Dump(pMsg, NULL, NULL); /* dump pMsg to stdout */

iRet = MSG_Dump(pMsg, "msg_dump.log", &tError);
if (iRet < 0) {
    printf("Error: MSG_Dump failed(%s)\n", tError.sErrText);
    return -1;
}

```



## int MSG\_SetStr(TMsg \*p\_pMsg, int p\_iTagNum, char \*p\_sVal)

---

### Description

This function is used to set a string type value to the tag value of the given message instance. If the tag is defined as an array field and this function is called multiple times, the values are stored as the array data in message object.

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- char \*p\_sVal : string type value to set

### Return : int

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iRet;
...
iRet = MSG_SetStr(pMsg, TAG_sCcy, "USD");
if (iRet < 0) {
    printf("Error: MSG_SetStr failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
```

## int MSG\_SetInt(TMsg \*p\_pMsg, int p\_iTagNum, int p\_iVal)

---

### Description

This function is used to set an integer type value to the tag value of the given message instance. If the tag is defined as an array field and this function is called multiple times, the values are stored as the array data in message object.

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_iVal : integer type value to set

### Return : int

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iRet;
...
iRet = MSG_SetInt(pMsg, TAG_iDiscrvId, 3);
if (iRet < 0) {
    printf("Error: MSG_SetInt failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
```

```
}

```

## int MSG\_SetDbl(TMsg \*p\_pMsg, int p\_iTagNum, double p\_dVal)

---

### Description

This function is used to set a double type value to the tag value of the given message instance. If the tag is defined as an array field and this function is called multiple times, the values are stored as the array data in message object.

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- double p\_dValue : double type value to set

### Return : int

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iRet;

...
iRet = MSG_SetDbl(pMsg, TAG_dFairPrice, 3);
if (iRet < 0) {
    printf("Error: MSG_SetDbl failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
```

## int MSG\_SetBool(TMsg \*p\_pMsg, int p\_iTagNum, int p\_bVal)

---

### Description

This function is used to set a boolean type value to the tag value of the given message instance. If the tag is defined as an array field and this function is called multiple times, the values are stored as the array data in message object.

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_Value : integer type value to set(0 : false, others : true)

### Return : int

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.



**Example**

```

int iRet;

...
iRet = MSG_SetBool(pMsg, TAG_bDiffSensYN, 1);
if (iRet < 0) {
    printf("Error: MSG_SetBool failed(%s)\n",MSG_GetLastError(pMsg));
    return -1;
}

```

## int MSG\_SetDate(TMsg \*p\_pMsg, int p\_iTagNum, char \*p\_sDate)

---

**Description**

This function is used to set a date type value to the tag value of the given message instance. If the tag is defined as an array field and this function is called multiple times, the values are stored as the array data in message object. The format of a date type is 8 bytes character as 'YYYYMMDD'. (YYYY : year, MM : month, DD : day)

**Parameters**

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- char \*p\_sDate : string type value to set (YYYYMMDD)

**Return : int**

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```

int iRet;

...
iRet = MSG_SetDate(pMsg, TAG_nDate, "20150615");
if (iRet < 0) {
    printf("Error: MSG_SetDate failed(%s)\n",MSG_GetLastError(pMsg));
    return -1;
}

```

## int MSG\_SetSub(TMsg \*p\_pMsg, int p\_iTagNum, TMsg \*p\_pSub)

---

**Description**

This function is used to set a sub message instance to the tag value of the given message instance.

If the tag is defined as an array field and this function is called multiple times, the values are stored as the array data in message object.

**Parameters**

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- TMsg \*p\_pSub : message instance to set

**Return : int**

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```
int iRet;
TMsg *pSub = NULL;
...
pSub = MSG_GetNewMsg(MSG_IrVanilla, &tError);
...
iRet = MSG_SetInt(pMsg, TAG_mIrVanilla, pSub);
if (iRet < 0) {
    printf("Error: MSG_SetInt failed(%s)\n",MSG_GetLastError(pMsg));
    return -1;
}
```

## int MSG\_GetStrLen(TMsg \*p\_pMsg, int p\_iTagNum)

---

### Description

This function is used to get the length of the string field corresponding to p\_iTagNum from the message instance(p\_pMsg). This length is used to determine the size of the string buffer which is used by the MSG\_GetStr() function

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)

### Return : int

If this value is more than zero, it is the length of the string of the field.

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iLen;
...
iLen = MSG_GetStrLen(pMsg, TAG_sCcy);
if (iLen < 0) {
    printf("Error: MSG_GetStrLen failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
```

## int MSG\_GetStr(TMsg \*p\_pMsg, int p\_iTagNum, char \*p\_sVal)

---

### Description

This function is used to get a string value corresponding to p\_iTagNum from the message instance(p\_pMsg).

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- char \*p\_sVal : string buffer to get(this pointer must be allocated)

### Return : int

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iLen;
int iRet;
char *sCcy = NULL;
...
iLen = MSG_GetStrLen(pMsg, TAG_sCcy);
if (iLen < 0) {
    printf("Error: MSG_GetStrLen failed(%s)\n", MSG_GetLastError(pMsg));
}
```

```

    return -1;
}
sCcy = (char *)malloc(iLen + 1);
iRet = MSG_GetStr(pMsg, TAG_sCcy, sCcy);
if (iRet < 0) {
    printf("Error: MSG_GetStr failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
...
free(sCcy);

```

## char \*MSG\_GetStrEx(TMsg \*p\_pMsg, int p\_iTagNum, int \*p\_pErrCode)

---

### Description

This function is used to get a string value corresponding to p\_iTagNum from the message instance(p\_pMsg).

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int \*p\_pErrCode : error code value(negative if this function failed)

### Return : char \*

This function returns the pointer to the string corresponding to p\_iTagNum. This pointer must be freed after it is used. If this value is NULL, it means that the function call is failed.

### Example

```

int iRet;
char *sCcy = NULL;
...
sCcy = MSG_GetStr(pMsg, TAG_sCcy, &iRet);
if (iRet < 0 || sCcy == NULL) {
    printf("Error: MSG_GetStr failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
...
free(sCcy);

```

## int MSG\_GetInt(TMsg \*p\_pMsg, int p\_iTagNum, int \*p\_iVal)

---

### Description

This function is used to get an integer type value corresponding to p\_iTagNum from the message instance(p\_pMsg).

### Parameters

- TMsg \*p\_pMsg : message instance pointer

- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int \*p\_iVal : integer type variable to get

**Return : int**

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```
int iRet;
int iDiscrvId;
...
iRet = MSG_GetInt(pMsg, TAG_iDiscrvId, &iDiscrvId);
if (iRet < 0) {
    printf("Error: MSG_GetInt failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
```

## int MSG\_GetDbl(TMsg \*p\_pMsg, int p\_iTagNum, double \*p\_dVal)

---

**Description**

This function is used to get an double type value corresponding to p\_iTagNum from the message instance(p\_pMsg).

**Parameters**

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- double \*p\_dVal : double type variable to get

**Return : int**

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```
int iRet;
double dFixedRate;
...
iRet = MSG_GetDbl(pMsg, TAG_dFixedRate, &dFixedRate);
if (iRet < 0) {
    printf("Error: MSG_GetDbl failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
```

## int MSG\_GetBool(TMsg \*p\_pMsg, int p\_iTagNum, int \*p\_bVal)

---

**Description**

This function is used to get a boolean type value corresponding to p\_iTagNum from the message instance(p\_pMsg).

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int \*p\_bVal : integer type variable

### Return : int

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iRet;
int bDiffSensYN;
...
iRet = MSG_GetBool(pMsg, TAG_bDiffSensYN, &bDiffSensYN);
if (iRet < 0) {
    printf("Error: MSG_GetBool failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
if (bDiffSensYN) {
    /* this means true */
}
```

## int MSG\_GetDate(TMsg \*p\_pMsg, int p\_iTagNum, char \*p\_sVal)

### Description

This function is used to get a date type value corresponding to p\_iTagNum from the message instance(p\_pMsg).

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- char \*p\_sVal : char[9] type variable

### Return : int

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iRet;
char nDate[8+1];
...
iRet = MSG_GetDate(pMsg, TAG_nDate, &nDate); /* YYYYMMDD */
if (iRet < 0) {
    printf("Error: MSG_GetDate failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
```

TMsg \*MSG\_GetSub(TMsg \*p\_pMsg, int p\_iTagNum, int \*p\_pErrCode)

---

### Description

This function is used to get a sub message instance corresponding to p\_iTagNum from the message instance(p\_pMsg).

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int \*p\_pErrCode : integer variable to get error code

### Return : TMsg \*

This return value means the pointer to sub message instance. If this is NULL, it means the function call failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iRet;
TMsg *pSub = NULL;
...
pSub = MSG_GetSub(pMsg, TAG_mIrVanilla, &iRet);
if (iRet < 0 || pSub == NULL) {
    printf("Error: MSG_GetSub failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
```

## int MSG\_GetArrSize(TMsg \*p\_pMsg, int p\_iTagNum)

---

### Description

This function is used to get the size of array corresponding to p\_iTagNum from message instance(p\_pMsg).

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)

### Return : int

This return value is the size of array

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

### Example

```
int iRet;
int iArrSize;
int i;
...
iArrSize = MSG_GetArrSize(pMsg, TAG_sCcy);
if (iArrSize < 0) {
    printf("Error: MSG_GetArrSize failed(%s)\n", MSG_GetLastError(pMsg));
    return -1;
}
for (i = 0; i < iArrSize; i++) {
    iRet = MSG_GetAtIntArr(pMsg, TAG_iDisrcrvId, i, &iId);
    ...
}
```

## int MSG\_GetAtStrLen(TMsg \*p\_pMsg, int p\_iTagNum, int p\_iIdx)

---

### Description

This function is used to get the length of the string corresponding to p\_iTagNum and p\_iIdx which specifies an index of array elements. This value is used to determine the size of the string buffer which is used by the MSG\_GetAtStrArr() function

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_iIdx : array index to get(index starts at zero)

### Return : int

This return value is the length of the string.



If this return value is less than zero, it means that the function call is failed. `Msg_GetLastError()` function let you know the reason why it failed.

### Example

```
int iLen;
...
for (i = 0; i < iArrSize; i++) {
    iLen = MSG_GetAtStrLen(pMsg, TAG_sCcy, i);
    if (iLen < 0) {
        printf("Error: MSG_GetAtStrLen failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
}
```

## int MSG\_GetAtStrArr(TMsg \*p\_pMsg, int p\_iTagNum, int p\_iIdx, char \*p\_sVal)

---

### Description

This function is used to get the string value corresponding to `p_iTagNum` and `p_iIdx` which specifies an index of array elements.

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_iIdx : array index to get(index starts at zero)
- char \*p\_sVal : string buffer to get(this pointer must be allocated)

### Return : int

If this return value is less than zero, it means that the function call is failed. `Msg_GetLastError()` function let you know the reason why it failed.

### Example

```
int iLen;
int iRet;
char *sCcy = NULL;
...
for (i = 0; i < iArrSize; i++) {
    iLen = MSG_GetAtStrLen(pMsg, TAG_sCcy);
    if (iLen < 0) {
        printf("Error: MSG_GetAtStrLen failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
    sCcy = (char *)malloc(iLen + 1);
    iRet = MSG_GetAtStrArr(pMsg, TAG_sCcy, sCcy);
    if (iRet < 0) {
        printf("Error: MSG_GetAtStrArr failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
}
```

```

}
...
free (sCcy);
}

```

`char *MSG_GetAtStrArrEx(TMsg *p_pMsg, int p_iTagNum, int p_iIdx, int *p_pErrCode)`

---

### Description

This function is used to get the string value corresponding to `p_iTagNum` and `p_iIdx` which specifies an index of array elements.

### Parameters

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_iIdx : array index to get(index starts at zero)
- int \*p\_pErrCode : error code value(negative if this function failed)

### Return : char \*

This function returns the pointer to the string corresponding to `p_iTagNum`. This pointer must be freed after it is used. If this value is NULL, it means that the function call is failed.

### Example

```

int iRet;
char *sCcy = NULL;
...
for (i = 0; i < iArrSize; i++) {
    sCcy = MSG_GetAtStrArrEx(pMsg, TAG_sCcy, &iRet);
    if (iRet < 0 || sCcy == NULL) {
        printf("Error: MSG_GetAtStrArrEx failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
    ...
    free (sCcy);
}

```

`int MSG_GetAtIntArr(TMsg *p_pMsg, int p_iTagNum, int p_iIdx, int *p_iVal)`

---

### Description

This function is used to get the integer value corresponding to `p_iTagNum` and `p_iIdx` which specifies an index of array elements.

### Parameters

- TMsg \*p\_pMsg : message instance pointer

- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_iIdx : array index to get(index starts at zero)
- int \*p\_iVal : integer type variable to get

**Return : int**

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```
int iRet;
int iDiscrvId;
...
for (i = 0; i < iArrSize; i++) {
    iRet = MSG_GetAtIntArr(pMsg, TAG_iDiscrvId, &iDiscrvId);
    if (iRet < 0) {
        printf("Error: MSG_GetAtIntArr failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
}
```

## int MSG\_GetAtDblArr(TMsg \*p\_pMsg, int p\_iTagNum, int p\_iIdx, double \*p\_dVal)

---

**Description**

This function is used to get the double value corresponding to p\_iTagNum and p\_iIdx which specifies an index of array elements.

**Parameters**

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_iIdx : array index to get(index starts at zero)
- double \*p\_dVal : double type variable to get

**Return : int**

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```
int iRet;
double dFixedRate;
...
for (i = 0; i < iArrSize; i++) {
    iRet = MSG_GetAtDblArr(pMsg, TAG_dFixedRate, &dFixedRate);
    if (iRet < 0) {
        printf("Error: MSG_GetAtDblArr failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
}
```

```
}

```

```
int MSG_GetAtBoolArr(TMsg *p_pMsg, int p_iTagNum, int
p_iIdx, int *p_bVal)
```

---

**Description**

This function is used to get the boolean value corresponding to p\_iTagNum and p\_iIdx which specifies an index of array elements.

**Parameters**

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_iIdx : array index to get(index starts at zero)
- int \*p\_bVal : integer type variable to get

**Return : int**

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```
int iRet;
int bDiffSensYN;
...
for (i = 0; i < iArrSize; i++) {
    iRet = MSG_GetAtBoolArr(pMsg, TAG_bDiffSensYN, &bDiffSensYN);
    if (iRet < 0) {
        printf("Error: MSG_GetAtBoolArr failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
    if (bDiffSensYN) {
        /* this means true */
    }
}
```

```
int MSG_GetAtDateArr(TMsg *p_pMsg, int p_iTagNum, int
p_iIdx, char *p_sVal)
```

---

**Description**

This function is used to get the date value corresponding to p\_iTagNum and p\_iIdx which specifies an index of array elements.

**Parameters**

- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)

- int p\_iIdx : array index to get(index starts at zero)
- char \*p\_sVal : char[9] type variable

**Return : int**

If this return value is less than zero, it means that the function call is failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```
int iRet;
char nDate[8+1];
...
for (i = 0; i < iArrSize; i++) {
    iRet = MSG_GetAtDateArr(pMsg, TAG_nDate, &nDate); /* YYYYMMDD */
    if (iRet < 0) {
        printf("Error: MSG_GetAtDateArr failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
}
```

## TMsg \*MSG\_GetAtSubArr(TMsg \*p\_pMsg, int p\_iTagNum, int p\_iIdx, int \*p\_pErrCode)

---

**Description**

This function is used to get the sub message instance corresponding to p\_iTagNum and p\_iIdx which specifies an index of array elements.

**Parameters**

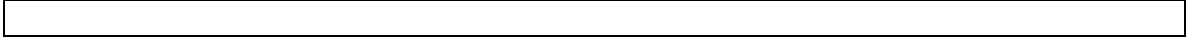
- TMsg \*p\_pMsg : message instance pointer
- int p\_iTagNum : tag number (TAG\_{tagname} macros)
- int p\_iIdx : array index to get(index starts at zero)
- int \*p\_pErrCode : integer variable to get error code

**Return : TMsg \***

This return value means the pointer to sub message instance. If this is NULL, it means the function call failed. Msg\_GetLastError() function let you know the reason why it failed.

**Example**

```
int iRet;
TMsg *pSub = NULL;
...
for (i = 0; i < iArrSize; i++) {
    pSub = MSG_GetAtSubArr(pMsg, TAG_mIrVanilla, &iRet);
    if (iRet < 0 || pSub == NULL) {
        printf("Error: MSG_GetAtSubArr failed(%s)\n",
            MSG_GetLastError(pMsg));
        return -1;
    }
}
```



The End.