fischertechnik Interfaces

umFish40.DLL

VC++, C#, VB.NET, Delphi, Visual Basic 6
& and the FishPanel40

Documentation for Version 4.1

Ulrich Müller

Contents

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Bild Einfügen | Grafik | Aus Datei | Office | Fisch6.WMF

umFish40.DLL

Common

umFish40.DLL is based on the FtLib module v59 supplied by fischertechnik integrated in umFish40.DLL. The listed Interface are supported in the so called Online Mode (permanent connection to the PC) :

- First ROBO Interface at USB(ifTyp 0)
- Intelligent Interface (ifTyp 10)
- Intelligent Interface with Slave (ifTyp 20)
- ROBO Interface, Intelligent Interface Mode (ifTyp 50)
- ROBO Interface at USB (ifTyp 60)
- ROBO Interface at COM (ifTyp 70)
- ROBO Interface via RF (ifTyp 80)
- ROBO I/O Extension at USB (ifTyp 90)
- ROBO RF Datalink at USB (ifTyp 110)

The ROBO Inteface can be attached with up to 3 ROBO I/O Extensions.

Up to now the M- and O-Outputs and the I- IR- A-Inputs are supported.

Several Interfaces can be operated simultaneous (COM / USB mixed too). The special Interface is identified by a handle (iHandle).

In addition to the functions offered by FtLib umFish40.DLL supports an impulse counter for each I-Input, opening and closing of an input are counted separately. Based on this there are RobMotors : A fix combination of motor, end switch an impuls switch ->
M1, I1, I2 ... M4, I7, I8.

Goal of the umFish40.DLL developement is building a base for using it from most of the common programming languages. Therefore no C++ typical data types are used. Only int (32bit, signed) variables are used.Never the less some programming languages nee special constructs : Java -> a wrapper.DLL (JNI), script languages -> a ActiveX.DLL. The return values of the type LPCSTR are an exeption, they only can be used with VC++.

Not contained in the download package is the ROBO Interface firmware, the USB driver and the FtLib files. They can be downloaded from
http://www.fischertechnik.de/computing/software.html.

For installing firmware and USB driver the best is to use ROBO Pro. The FtLib is not needed separately.

For testing purposes of a new model umFishDP40.EXE is recommended (part of umFish41.ZIP).

Note : If a running application is aborted from the IDE it is possible not all storage is released. On too less storage : Boot him.

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Functions

Notations

Parameter names and their value range

Value range in brackets : ROBO Interface with 3 Extensions connected.

iHandle	Handle to identify the actual Interface (1 – 8).
MotNr	Numberr of an M Output 1 – 4 (16)
LampNr	Number of an O Output 1 – 8 (32). "Half" M Output Not with the Intelligent Interface.
InputNr	Number of an I Input 1 – 8 (32). Intelligent Interface : E Input 1 – 8 (16)
Inputwert	Value of an I Input 0 / 1
InputStatus	State of all (max. 32) I Inputs, I1 right, each 1bit.
CounterNr	Number of th Counter of an I Input 1 – 8 (32)
AnalogNr	AX / AY / AXS1 / AXS2 / AXS3 : 1 – 2 (5) Intelligent Interface EX / EY : 1 – 2
Analogwert	Value of an A Input 0 - 1023
VoltNr	A1 / A2 / AV / AZ : 1 – 4 Not with the Intelligent Interface
Dir	Rotation direction of the M Outputs : Off, Aus = 0, Left, Links = 1, Right, Rechts = 2
MotorStatus	Direction values of all motors, M1 right bits, 2bit
Mode	Operating mode of a motor. Normal = 0, RobMode = 1
ModeStatus	Operation mode of al motors, M1 right bits, 2bit
Speed	PWM speed level (M Outputs) : 0 – 7
SpeedStatus	Speed level of 8 motors M1 – M8 and M9 – M16, M1 / M9 right bits, 4bit
Power	PWM level (O-Ausgänge) : 0 – 7
OnOff	On, Ein / Off, Aus : 1 / 0
ICount	Value of an impulse counter
ifTyp	Type of the Interface (look : Common remarks)
SerialNr	Standard serial number of an ROBO Interface. Serial number = 0 means first Interface found on USB.
ComNr	Number of the COM port the Interface is connected to. 1 – 4
RbFehler	Error code rbFehler or 0
int	Common 32bit int value, signed.

All parameters are of the type int (32bit, signed)

Messages

Are handle within the structure MessageData :

```
typedef struct {
  BYTE HwId;        Sending mode (allways 2 : Send to all other participants)
  BYTE SubId;       Class of the message
  USHORT MsgId;     Number of the message
  USHORT Msg;       The message itself.
} MessageData;
```

With exception of HwId the parts of the message can be used by own suggestions. A special use besides word borders is possible. Mostly the interpretation of the context is the right way. Testing with VC++ IDE they could be inspected.

Error Handling

All functions have an return value, which is rbFehler (0xE0000001). In case of success 0 or the special return value of the function. The return codes of FtLib are not used because on normal testing they are not very helpfull.

Function List

iHandle	**rbOpenInterfaceUSB**(ifTyp, SerialNr) Making of a connection to an Interface at USB (via ROBO RF Datalink included, ROBO Interface with the same channel number is used). ifTyp = 0 : first Interface at USB, in this case SerialNr = 0. *ROBO Pro* : 7.1.1 (nearly)
iHandle	**rbOpenInterfaceRF**(SerialNrInterface) Making of a connection to an Interface via ROBO RF Datalink (first Datalink on USB). For identification of the Interface SerialNrInterface. The Interface must have power but no connection via USB.
iHandle	**rbOpenInterfaceCOM**(ifTyp, ComNr, AnalogZyklen) Making of an connection to an Interface at COM ROBO and Intelligent Interface. *ROBO Pro* : 7.1.1 (nearly)
rbFehler	**rbCloseInterface**(iHandle) Ending an Interface connection *ROBO Pro* : 7.1.e (nearly)

A- and I Inputs

OnOff	**rbGetInput**(iHandle, InputNr) Read the state of the addressed IInput *ROBO Pro* : 7.1.3
int	**rbGetInputs**(iHandle) InputStatus : State of all I Inputs (I1 right, 1bit)
int	**rbGetAnalog**(iHandle, AnalogNr) Read of the actual analogous valus of the addressed A Input (AX, AY bzw. EX, EY and AXS1, AXS2, AXS3) *ROBO Pro* : 7.1.4
int	**rbGetIRKey**(iHandle, Code, KeyNr) Read the state of the address IR Keys of the IR sender
int	**rbGetVoltage**(iHandle, VoltNr) Read of the voltage value of the addressed A Input (A1 – A2, AV) *ROBO Pro* : 7.1.4

M- und O-Ausgänge :

rbFehler	**rbSetMotor**(iHandle, MotNr, Dir) Setting of an M Output with Speed = 7 *ROBO Pro* : 7.1.6
rbFehler	**rbSetMotorEx**(iHandle, MotNr, Dir, Speed) Setting of an M Output with specifying the Speed Speed will be not work with the Intelligent Interface *ROBO Pro* : 7.1.6
int	**rbGetMotors**(iHandle) State of all M Outputs (M1 right, 2bit)
rbFehler	**rbSetMotors**(iHandle, MotorStatus) Setting of all M Outputs (M1 right, 2bit), normal mode, speed = 7
rbFehler	**rbSetMotorsEx**(iHandle, MotorStatus, SpeedStatus, SpeedStatus16) Setting of all M Outputs, speed included, normal mode
int	**rbGetModeStatus**(iHandle, MotNr) State of the ModeStatus of one M Output (Normal = 0, RobMode = 1)

rbFehler **rbSetModeStatus**(iHandle, MotNr, Mode)
Setting the ModeStatus of one Moutput (Normal = 0, RobMode = 1)

rbFehler **rbSetLamp**(iHandle, LampNr, OnOff)
Setting of an Output with Power = 7
ROBO Pro : 7.1.7

rbFehler **rbSetLampEx**(iHandle, LampNr, OnOff, Power)
Setting of an O Output, Intensty included
ROBO Interface / Extension only
ROBO Pro : 7.1.7

rbFehler **rbRobMotor**(iHandle, MotNr, Dir, Speed, ICount)
Starting of a M Output with RobMode (Motor, end switch, impulse switch). The function run asynchronous and ends if ICount = 0 or end switch is true (on left turning). ICount state can be controlled with rbGetCounter.
ROBO Pro : 7.1.6 and 7.1.9

rbFehler **rbRobMotors**(iHandle, MotorStatus, SpeedStatus, SpeedStatus16, ModeStatus)
Setting of the complete state of all M Outputs, used counters must be set separately.

Impulse Counter :

ICount **rbGetCounter**(iHandle, CounterNr)
Read the value of an impulse counter
ROBO Pro : 7.1.9

rbFehler **rbSetCounter**(iHandle, CounterNr, ICount)
Setting the value of an impulse counter
ROBO Pro : 7.1.9

rbFehler **rbClearCounter**(iHandle)
Clear all impulse couters to 0.
ROBO Pro : 7.1.9

Radio Functions :

rbFehler	**rbClearMessagesIn**(int iHandle) Clearing of the queque of incoming messages
rbFehler	**rbClearMessagesOut**(int iHandle) Clearing of the queque of outgoing messages
rbFehler	**rbGetMessage**(int iHandle, MessageData* inNachricht) Peek of a broadcast message from the queque
int	**rbIsMessage**(int lHandle) check for incoming messages 0 = no, > 0 = number of message or rbFehler
rbFehler	**rbSendMessage**(int iHandle, MessageData* outNachricht) Poke a broadcast message to the output queque
rbFehler	**rbSendMessageEx**(int iHandle, MessageData* outNachricht, int Spez) conditioned poke of a broadcast message : 0 = always, 1 if new inspect of the last one in the queque, 2 = if not contained in the queque.

Information Functions : *ROBO Pro : Interface Test*

int	**rbGetActDeviceType**(iHandle) Read of the device type of the active Interface Only if rbOpenInterface has been successfull -> rbFehler
int	**rbGetActDeviceSerialNr**(iHandle) Read of the serial number of the active Interface. Only if rbOpenInterface has been successfull -> rbFehler
int	**rbGetActDeviceFirmwareNr**(iHandle) Read of the firmware number of the active Interface. Erfolgreiches rbOpenInterface erforderlich, sonst RbFehler
LPCSTR	**rbGetActDeviceFirmware**(iHandle) Read of the firmware string of the active Interface. Only if rbOpenInterface has been successfull -> rbFehler
LPCSTR	**rbGetActDeviceName**(iHandle) Read of the name of the active Interface. Only if rbOpenInterface has been successfull -> rbFehler

Notes to the umFish40.DLL Source

umFish40.DLL is a system.DLL, written in VC++ 6.0, which uses for the real Interface access the functions of FtLib_Static_LIBCMT_Release.lib (supported by fischertechnik). It offers a number of base functions for the access to the Interfaces of the ROBO series and the Intelligent Interface. In addition to the functions offered by FtLib umFish40.DLL supports an impulse counter for each I-Input, opening and closing of an input are counted separately. Based on this there are RobMotors : A fix combination of motor, end switch an impuls switch -> M1, I1, I2 ... M4, I7, I8.

Goal of the umFish40.DLL developement is building a base for using it from most of the common programming languages. Therefore no C++ typical data types are used. Only int (32bit, signed) variables are used.Never the less some programming languages nee special constructs : Java -> a wrapper.DLL (JNI), script languages -> a ActiveX.DLL. The return values of the type LPCSTR are an exeption, they only can be used with VC++.

The source contains the following main files :

- umFish40.DEF : Declarations of the DLL entries
- umFish40.H : Declarations of external funtions, interna
- umFish40.CPP : The functions.
- umFtLib.H : The fischertechnik FtLib.H for FtLib access.

FtLib Functions

The FtLib controls the direct access to the Interfaces. Therefore it containes a series of function to control the connection to the Interfaces (OpenFtUsbDevice / OpenFtCommDevice ... StartFtTransferArea ...) and some information functions (GetFtDeviceType / GetFirmwareStrg ...) and in additon functions for the download of assembled programs to the ROBO Interface (not used in umFish40.DLL).

The main part of communication with the Interface is done using a communication area – the TransferArea – this area is actualized every 10 ms. It contains the values of the Inputs, Outputs .... In this frequence a CallBack Entry is called. With data in a structure : NOTIFICATION_EVENTS. It is used by umFish40.DLL to supply additional functions.

umFish40.DLL Functions

Main task of umFish40.DLL is to prepare the data of the TransferArea and to convert them to functions. e.g. 'unsigned char E_Main' is converted to the function rbGetInput(InputNr), which notes the state of a single I Input. The Inputs and Outputs are counted – in opposite to FtLib – continously (I Inputs 1 – 32, M Outputs 1 – 16):

The complicate building of an Interface connection is reduced to a single function (rbOpenInterfaceUSB / rbOpenInterfaceCOM). The closing of a connection is reduced to rbCloseInterface.

The additional functions of umFish40.DLL are situated in a CallBack routine. They are extracted from the FtLib structure NOTIFICATION_EVENTS an transformed to functions.

The information functions of FtLib are offered as umFish40.DLL functions as far as it seems to be usefull.

The function Code Download is not supported.

umFish40.DLL Details

umFish40.DLL supports up to 8 Interface connection for simultaneous operating. The instance data therefore are placed in the array ROBOInstanz. The single OpenInterface returns as an handle an index to that array to identify the instance.

A typical access to the TransferArea looks like this :

```
rbI[iHandle].ftDCB->M_Main |= MLinks[n];
```

Switch Mn to left

The construction :

```
if(rbI[iHandle].ftDCB == NULL) return rbFehler;
```

is used to check for a correct OpenInterface.

```
if(!(IsFtTransferActiv(rbI[iHandle].ftHandle) ==
     FTLIB_ERR_THREAD_IS_RUNNING)) return rbFehler;
```

fis an check for an existing connection to an Interface.

The Inputs and Outputs are counted beginning with 1, internally beginning with 0. Therefore e.g. an MotNr-- is to be found at the beginnig of a function.

Masking of Input and Output areas is alternatively done by table and by shifting.

Using umFish40.DLL

Common

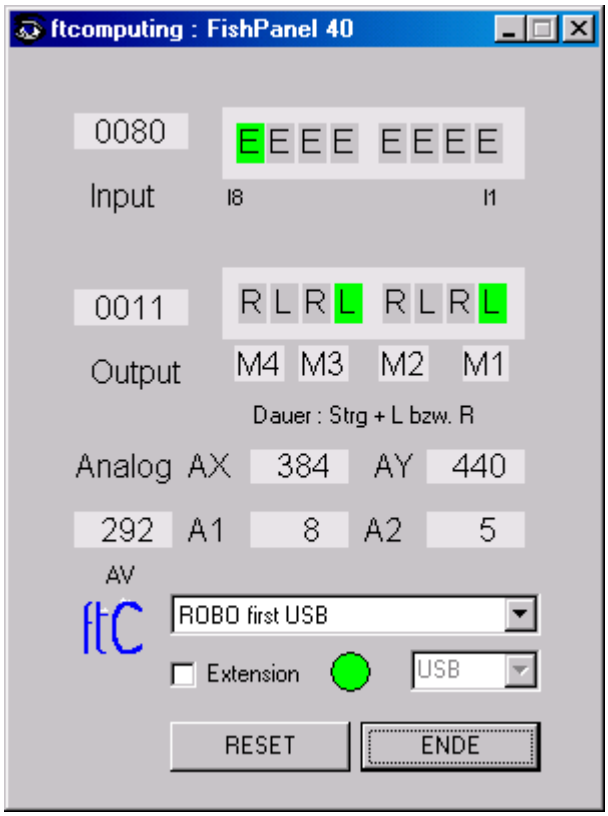
umFish40.DLL is delivered as compiled DLL and as VC++ project.

Additionaly there are some "H-Files" (declarations, classes) for use in different programming languages. They are supplemented by a typical HelloROBO program (M1 blinking 5 times after I1 comes to true). First ROBO Interface at USB.

umFish40.DLL first is a base for the development of own libraries. Direct using may be complicated because of no DoEvents (interrupt to process Windows messages) or ESC key (cancel) is contained. Some programming languages (Script, Logo, Java ..) can't process system.DLLs. For many languages exits FishFace class libraries based on umFish40.DLL which have more sophisticated functions too.

The Hello projects contain a sample for sending an arbitrary message for demonstration purposes. Nevertheless the Hello can be executed on ROBO Interfaces without radio functions or on ROBO I/O Extensions.

InterfacePanel



Is delivered as EXE file (umFishDP40.EXE). Can be used to control newly assembled fischertechnik model for ist function and for setting the model to a defined position.

VC++

New VC++ 6.0 project

1. Menu Files New ...
2. Add the program source
3. Add umFish40.H and umFish40.lib
4. umFish40.DLL (Release Version) must be in an acceble path : Directory Debug of the project or WinNT\System32
5. Projekteinstellungen : Win32Debug | C/C++ Kategorie CodeGeneration | LaufzeitBibliothek : Multithreaded.DLL (sorry german version)

```
#include <Windows.h>
#include <iostream.h>
#include "../umFish40VC.H"

void main() {
  char Ende;
  cout << "--- HalloROBO : es geht los ---" << endl;
  int iHandle = rbOpenInterfaceUSB(ftROBO_first_USB, 0);
  if (iHandle == rbFehler) {
    cout << "Da stimmt etwas nicht : ENDE (Enter-Taste)" << endl;
    cin.get(Ende);
    return;
  }
  cout << "Interface : " << rbGetActDeviceName(iHandle)
       << ", Typ : " << rbGetActDeviceType(iHandle)
       << ", SerialNr : " << rbGetActDeviceSerialNr(iHandle) <<
endl;
  cout << "Firmware  : " << rbGetActDeviceFirmware(iHandle) << endl;
  cout << endl << "Start : I1 druecken" << endl;
  while(!rbGetInput(iHandle, 1)) {Sleep(123);}
  for (int i = 0; i < 5; i++) {
    rbSetMotor(iHandle, 1, 1);
    Sleep(333);
    rbSetMotor(iHandle, 1, 0);
    Sleep(333);
  }
  rbCloseInterface(iHandle);
  cout << endl << "--- FINIS : Enter-Taste ---" << endl;
  cin.get(Ende);
}
```

C#

```
using System;
using System.Threading;
using cs = System.Console;
using um = HelloCSROBO.umFish40CS;

namespace HelloCSROBO {
   class Rahmen {
      uint iHandle;
      [STAThread]
      static void Main(string[] args)  {
         Rahmen rt = new Rahmen();
         cs.WriteLine("--- Hello ROBO gestartet ---");
         rt.Action();
         cs.WriteLine("--- Hello ROBO beendet (Return-Taste) ---");
         cs.Read();
      }
      private void Action() {
         iHandle =
              um.rbOpenInterfaceUSB((int)IFTypen.ftROBO_first_USB, 0);
         if(iHandle == um.rbFehler) {
            cs.WriteLine("Da stimmt was nicht : ENDE (Return-Taste)");
            return;
         }
         cs.WriteLine("IN ACTION : Start I1 drücken");
         while(um.rbGetInput(iHandle, 1) == 0) {um.Sleep(123);};
         for(int i = 0; i < 5; i++) {
            cs.WriteLine("Blinker : " + i);
            um.rbSetMotor(iHandle, 1, 1);
            um.Sleep(333);
            um.rbSetMotor(iHandle, 1, 0);
            um.Sleep(333);
         }
         um.rbCloseInterface(iHandle);
      }
   }
}
```

Console project. The elements of the class umFish40CS are static, in this case no instance is needed.

VB.NET

```
Imports cs = System.Console
Imports um = HelloVBNETRobo.umFish40VBNET

Module HelloMain

  Sub Main()
    Dim i%, iHandle%
    cs.WriteLine("--- Hello VB.NET gestartet ---")
      iHandle = um.rbOpenInterfaceUSB(IFTypen.ftROBO_first_USB, 0)
      If iHandle = um.rbFehler Then
        cs.WriteLine("Da stimmt was nicht : ENDE (Return-Taste)")
        Return
      End If
      cs.WriteLine("Interface : " & _
                um.rbGetActDeviceType(iHandle) & " / " _
                & um.rbGetActDeviceSerialNr(iHandle))
      cs.WriteLine("mit Firmware : " & _
                 um.rbGetActDeviceFirmwareNr(iHandle).ToString("X"))
      cs.WriteLine("IN ACTION : Start I1 drücken")
      While um.rbGetInput(iHandle, 1) = 0
        um.Sleep(123)
      End While
      For i = 1 To 5
        cs.WriteLine("Blinker : " & i)
        um.rbSetMotor(iHandle, 1, 1)
        um.Sleep(333)
        um.rbSetMotor(iHandle, 1, 0)
        um.Sleep(333)
      Next
      um.rbCloseInterface(iHandle)
      cs.WriteLine("--- Hello VB.NET beendet (Return-Taste) ---")
      cs.Read()
  End Sub

End Module
```

Console project.The elements of the class umFish40VBNET are static, in this case no instance is needed.

Delphi

Tested with Delphi4, I think it will do with Delphi 2 – Delphi 7.

```
program HalloDelphiROBO;

uses
  Windows, SysUtils,
  umFish40 in 'umFish40.PAS';
var
  ft, i: LongInt;
begin
  ft := rbOpenInterfaceUSB(ftiROBO_first_USB, 0);
  if ft = ftiFehler then begin
    WriteLn('Hier stimmt etwas nicht : ENDE (Enter-Taste)');
    ReadLn;
    exit;
  end
  else WriteLn('HalloDelphiROBO in Action');
  WriteLn('Interface : ' + IntToStr(rbGetActDeviceType(ft)) +
    ' / ' + IntToStr(rbGetActDeviceSerialNr(ft)));
  WriteLn('mit Firmware : ' +
IntToStr(rbGetActDeviceFirmwareNr(ft)));
  WriteLn('Start : I1 druecken');
  while rbGetInput(ft, 1) = 0 do Sleep(123);
  for i := 1 to 5 do begin
    WriteLn('Runde : ' + IntToStr(i));
    rbSetMotor(ft, 1, ftiEin);
    Sleep(333);
    rbSetMotor(ft, 1, ftiAus);
    Sleep(333);
 end;
  rbCloseInterface(ft);
  WriteLn('HalloDelphiROBO beendet'); ReadLn;
end.
```

Visual Basic 6

```
Option Explicit

Dim iHandle&

Private Sub Form_Load()
  iHandle = rbOpenInterfaceUSB(ftROBO_first_USB, 0)
  If iHandle = rbFehler Then
    MsgBox "Hello ROBO : Da stimmt etwas nicht"
    End
  End If
End Sub

Private Sub cmdAction_Click()
Dim i&
  lstAus.AddItem "Hello Robo gestartet"
  lstAus.AddItem "Interface : " & rbGetActDeviceType(iHandle) & _
      " / " & rbGetActDeviceSerialNr(iHandle)
  lstAus.AddItem "Firmware : " & rbGetActDeviceFirmwareNr(iHandle)
  lstAus.AddItem "Start : I1 drücken"
  Do: DoEvents: Sleep 123: Loop Until rbGetInput(iHandle, 1) = 1
  For i = 1 To 5
  lstAus.AddItem "Runde : " & i
    rbSetMotor iHandle, 1, 1
    DoEvents
    Sleep 333
    rbSetMotor iHandle, 1, 0
    DoEvents
    Sleep 333
  Next i
  lstAus.AddItem "FINITO : Das wars (x-Klicken)"
End Sub

Private Sub Form_Unload(Cancel As Integer)
  rbCloseInterface (iHandle)
End Sub
```

Notes to the Counters

An essential element of determining the position are the counters. There is a counter for each I Input (attention : I1 in some languages is 0 in others is 1). The counters will notivy (and count) each change of the state of an input (e.g. opening or closing a switch).

The counter can be read and set with special functions. The counter are used internally be some functions (e.g. rbRobMotor).

Notes to the Rob Functions

the Rob function are running in a special oprating mode, the RobMode. in thes mode the invlved counters are decreased. Reaching the value 0, the motor belonging to the counter is switched off.

Operating of a motor in RobMode uses a fix concept of wiring the motors. Each motor is associated with an en switch and an impulse switch :

Motor	Endtaster	Impulstaster
1	1	2
2	3	4
3	5	6
4	7	8
5	9	10
6	11	12
7	13	14
8	15	16

And up to 16 if connected to an ROBO Interface with 3 Extensions.

The motors are "left turning". That means, they run in direction of the end switch if turning ftLinks / ftLeft.

A single motors can be operated with rbRobMotor. The parameter ICount stands for the number of impulses to be run. ICount is decreased to 0.

All RobMotors can be operated with one function at the same time : rbRobMotors. The values for all motors come in the parameter :

MotorStatus : each motor 2bit, M1 : bit 0 and 1
00 : off, 01 left, 10 right.
SpeedStatus : each motor 4bit, M1 : bit 0-3,
0000 off, 0100 half power, ... 0111 full.
ModeStatus : each motor 2 bit, M1 : bit 0-1,
00 NormalMode, 01 RobMode.

Example : rbRobMotors(ft, 0x9, 0x74, 0x0, 0x05);
0x means Hexa, binary : MotorStatus 1001 SpeedStatus 01110100 ModeStatus 0101 -> M2 = right, Speed 7 with Rob-Mode, M1 = left, Speed 4 with RobMode. Other motors are stopped. Before using rbRobMotors the impulse counter for each RobMotor are to be set.

The motors operate simultaneously (up to 16 motors). They can be switched one after the other by rbRobMotor or all together with rbSetMotors. The stop if their special counter is come to 0. The MotorStatus bits are set to 0. Controlling MotorStatus for 0 can be used for synchronizing purpusoses. 00 of all RobMotor in MotorStatus means all motors are stopped, destination is reached.

Notes to Radio Control

Components of the radio control are the ROBO RF Datalink and ROBO Interfaces with RF card.

There are three different kinds of radio controlled operation :

1. **Route Through** : An Interface with RF card is connected via RF Datalink to the PC. The application will run without knowing the kind of connection. Advantage : A model with Interface and RF card can operate freely in the landscape. Controlling an user interface is situated on the PC.
   This is the kind of radio control supported by umFish40.DLL.
2. **Autonom** : Some Interface with RF card communicate via radio control. In this case the RF Datalink has a role as a **Messages Routers**. The applications are running on the Interfaces.
   Not supported by umFish40.DLL.
3. **Route Through** and **Message Router**. The first Interface is opperated by the PC application, the other run autonomously. The can be reached from the application of the first Interface via radio control.
   This kind of radio control is supported by umFish40.DLL on the side of the PC. Programming of the other Interfaces must be done with Renesas C or ROBO Pro.

Therefore umFish40.DLL supports some special functions :

- rbSendMessage for sending a buffered broadcast message.
– rbGetMessage and rbIsMessage to receive incoming messages from the input queque. In addition rbClearMessagesIn, rbClearMessagesOut for clearing the message queques.
– The structure MessageData for transporting the message data. HwId contains the kind of sending (RF Broadcast via radio, Code 2). Other fields of the structure can be used free.

The Hello Demos contain a rbSendMessage for a very simple attemp. But therefore some more preparation must be done :

- ROBO RF Datalink with RF2/0 at USB
  The Datalink must only be present.
- ROBO Intelligent Interface with radio card (with RF2/1) connected only to power and switch at I1 and a lamp on M1. The Interface is controlled by the PC. A message is to be sended and the lamp is blinking.
- ROBO Intelligent Interface with radio card (with RF2/2) connected only to power and a motor on M1. Loaded with an application (Renesas C / ROBO Pro) waiting in an endless loop for a message. Receiving a message – without looking to the contents – the motor on M1 is started for one second, left direction.

At Start of the demo the motor will run (RF 2/2), afterwards blinking is done.