ASCII to Unicode

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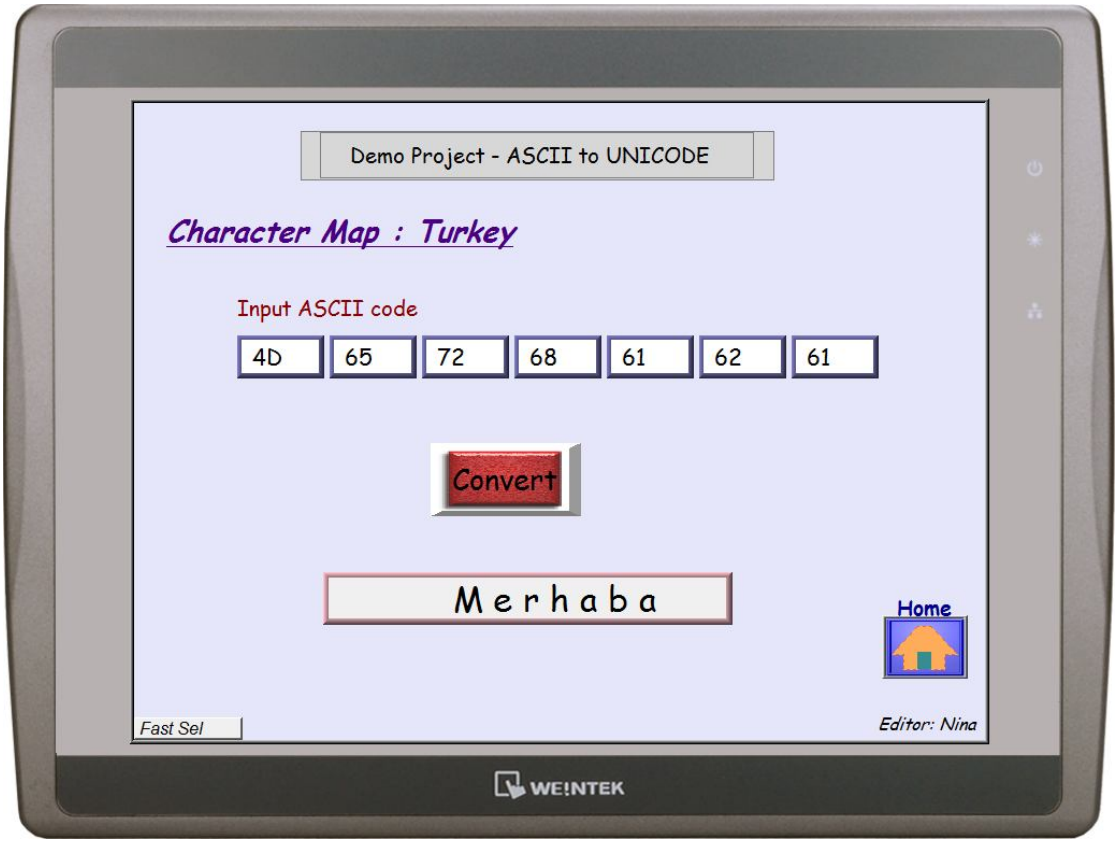
1. Overview and Operation

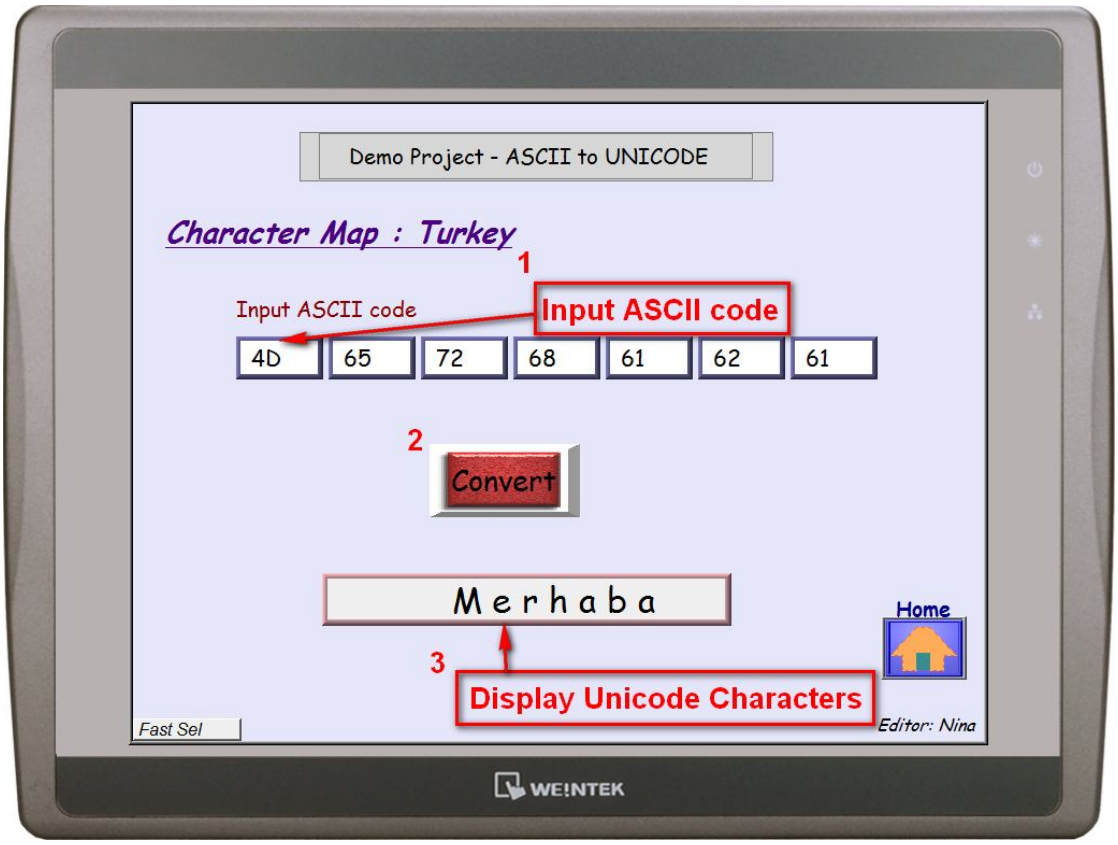
Overview

This demo project introduces how to use Numeric Input / ASCII Display Objects to convert PLC ASCII string to Unicode and display on HMI. In Microsoft Windows Operating System, a Character Map is offered for checking usable characters in the selected font. Input ASCII code of these characters, a Unicode character or special character can be displayed. This project offers conversion from ASCII to Unicode of three different languages: Cyrillic, Turkish and Central European Language.



Operation

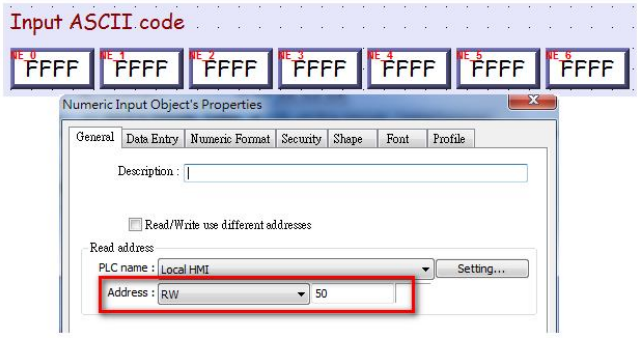
Input ASCII code via Numeric Input Objects; click Function Key [Convert], ASCII code will be converted to Unicode characters according to the settings in Macro Library.

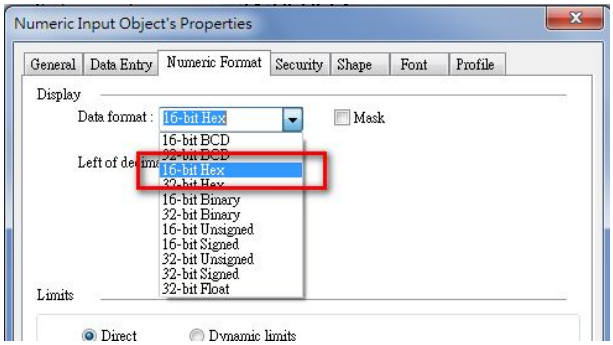

Demo Project - ASCII to UNICODE
Character Map : Turkey
1
Input ASCII code
Input ASCII code
4D
65
72
68
61
62
61
2
Convert
M e r h a b a
Home
3
Display Unicode Characters
Fast Sel
Editor: Nina
WEINTEK

2. Setting up the Screen (example: Turkish ASCII to Unicode)

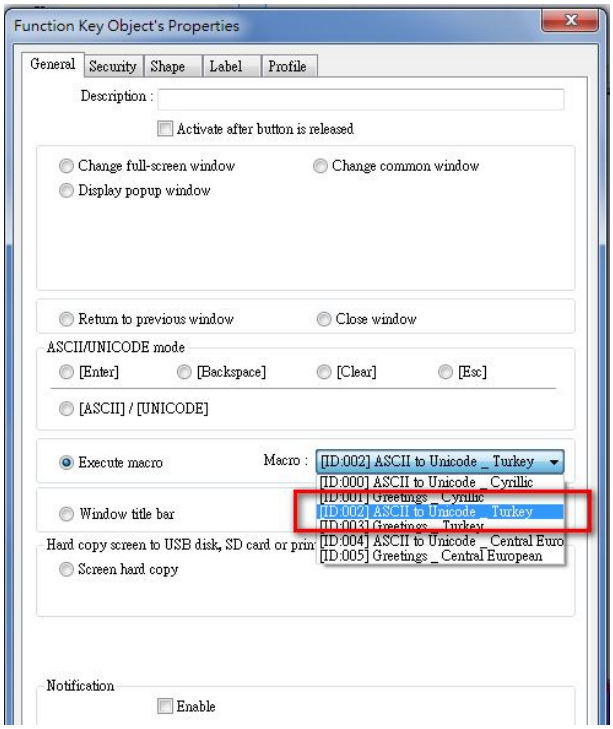
[Objects]

1. Create several Numeric Input Objects, set address type to RW, data format to 16-bit Hex.
EX: Create 7 Numeric Input Objects, set addresses to RW-50~RW-56.

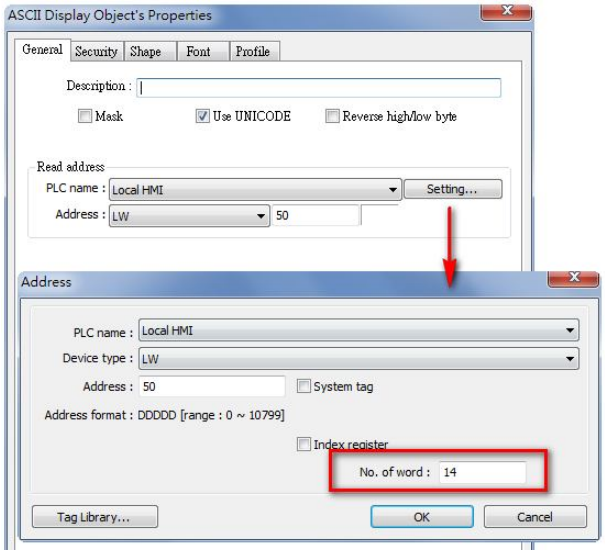




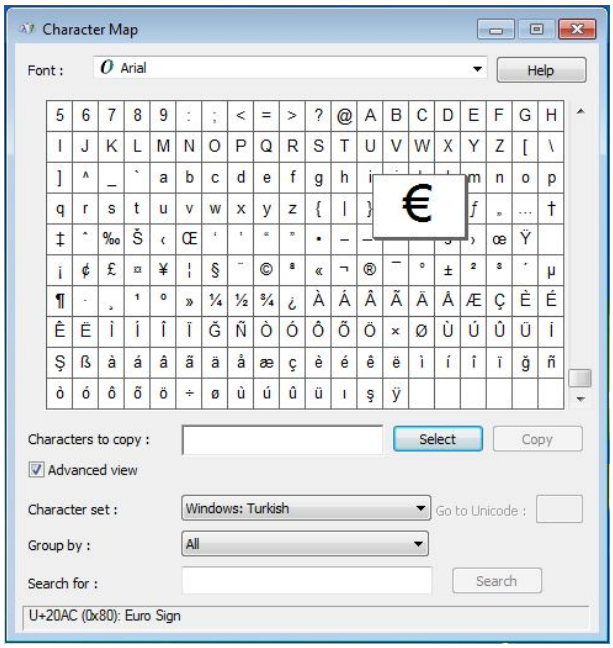
2. Create a Function Key Object to execute Macro, select the corresponding Macro such as: ASCII to Unicode _ Turkey.



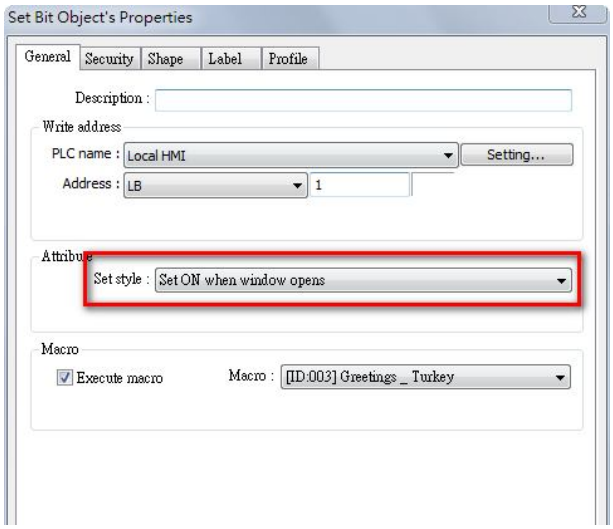
3. Create an ASCII Dispaly Object. Since that Macro funtions HIBYTE and LOBYTE are needed in the conversion of ASCII to Unicode, [No. of word] must set to twice as needed for displaying. EX: this project displays “hello” in Turkish: merhaba, the [No. of word] must at least set to 14.



4. Create several Text Objects on a new window, input all the Turkish ASCII characters in these objects for HMI to correctly display.
EX: ÀÕÑËæëêîî®

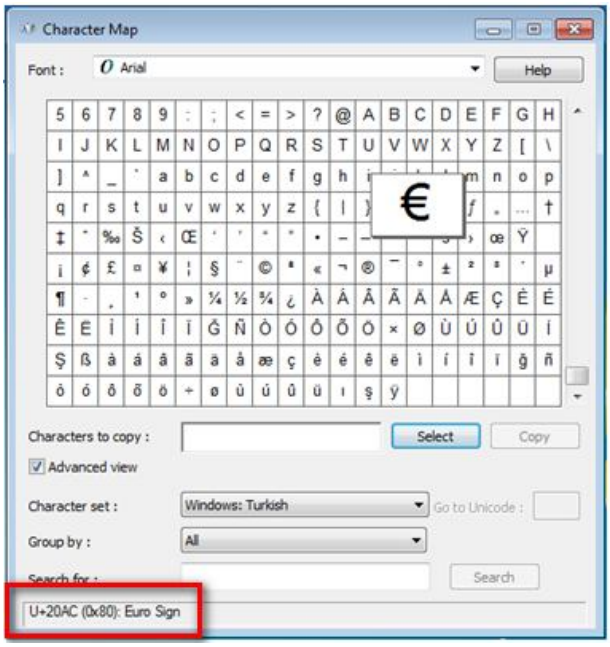


5. Create a Set Bit Object, [Set style]: “Set ON when window opens”, and then select the Macro to be executed automatically when the window is opened. EX: When the window is opened, the ASCII codes of the seven letters “merhaba” will directly be displayed on RW-50~RW56 respectively.



[Macro]

1. Character Map shows that Unicode corresponds to ASCII code. Write this code to Macro Library. The way to encode: A2U[n]=0xabcd. EX: € = U+20AC (0x80), since 0x80 is hexadecimal and should be converted to decimal=128, it is written as: A2U[128]=0x20AC



2. Commands in Macro Library are listed here. All the ASCII codes must be listed and then execute Macro HIBYTE or LOBYTE functions to culculate the corresponding Unicode. “x” : variation when executing, “out”: return value.

```
sub short Turkey_hibyte(short x)

short A2U[256], i,out=0, high, low
for i = 0 to 255
  A2U[i]=i
next i
A2U[128]=0x20AC
A2U[130]=0x201A
A2U[131]=0x0192
A2U[132]=0x201E
```

≈

```
A2U[251]=0x00FB
A2U[252]=0x00FC
A2U[253]=0x00FD
A2U[254]=0x00FE
A2U[255]=0x00FF

HIBYTE(x, high)
out=A2U[high]

return out
```

3. Read data from Numeric Input Object, convert data using subfunction then write to ASCII Display Object.

```

macro_command main()


short UNICODE[256],k, in[8],out[16]
short j=0
GetData(in[0], "Local HMI", RW, 50, 8)


out[0]=Turkey_hibyte(in[0])
out[1]=Turkey_lobyte(in[0])
out[2]=Turkey_hibyte(in[1])
out[3]=Turkey_lobyte(in[1])
out[4]=Turkey_hibyte(in[2])
```

3. Address

The object addresses used in this demo project are listed below, the addresses and object ID can be modified based on actual usage.

Object	Address	Object ID	Description
Window 10			
Function Key		FK_0	Switch to base window 11
		FK_1	Switch to base window 13
		FK_2	Switch to base window 15
Window 11			
Numeric Input	RW0~RW6	NE_0~NE_5	Numeric Input
Function Key		FK_0	Execute Macro [ID：000]
Function Key		FK_1	Return to Window 10
ASCII Display	LW0	AD_0	ASCII Display
Set Bit	LB0	SB_0	Auto. Execute Macro [ID：001] When Window Opens
Window 12			
Text			Cyrillic
Window 13			
Numeric Input	RW0~RW7	NE_0~NE_6	Numeric Input
Function Key		FK_0	Execute Macro [ID：002]
Function Key		FK_1	Return to Window 10
ASCII Display	LW0	AD_0	ASCII Display
Set Bit	LB0	SB_0	Auto. Execute Macro [ID：003] When Window Opens
Window 14			
Text			Turkish
Window 15			
Numeric Input	RW0~RW7	NE_0~NE_6	Numeric Input
Function Key		FK_0	Execute Macro [ID：004]
Function Key		FK_1	Return to Window 10
ASCII Display	LW0	AD_0	ASCII Display
Set Bit	LB0	SB_0	Auto. Execute Macro [ID：005] When Window Opens
Window 16			
Text			Central European Language

4. Function Reference

Function Name	Description
ASCII 2 Unicode	Convert ASCII code of Cyrillic, Turkish, and Central European Language to Unicode.