OS version & Engineering change for Fatek FBE/FBN PLC

- To tell the version of the main unit，you can just open up the cover at the center of the CPU module and see the EPROM labeling

  | FB-MAC |
  | V3.xx |

  ，where the "3.xx" is the OS version .

About the OS version：

- V3.0x : Original version of FBE/FBN PLC。

- V3.1x : Support absolute coordinate positioning while using FUN140 (High Speed Pulse Output) for motion control。

- V3.2x : Support convenient instructions FUN85 & FUN86 for temperature measurement & PID control via FB-4AJ(K)xx temperature module。

- V3.3x : Support upto 64 points of analog input via slim type FB-6AD analog input module，and also upto 64 points of analog output via slim type FB-2DA analog output module；

  Support convenient instructions FUN72 & FUN73 for temperature measurement & PID control via FB-J(K)4 temperature module。

☆☆☆ <u>Updating of FBE／FBN OS V3.40</u>　　　　8/18/2000

● Support convenient instruction for PID operation (FUN30,PID)

Refer to User's Manual II -- Advanced, Cahapter 21：General Purpose PID Control

● Support 48-bit division instruction (FUN23,DIV48)

Refer to User's Manual II -- Advanced, Page 9-2

● Support data sorting instruction (FUN113,SORT)

Refer to User's Manual II -- Advanced, Page 9-94

● Modify ramping instruction (FUN95,RAMP)

Refer to User's Manual II -- Advanced, Page 9-73

● Support FB-485P0, which is the signal converter for RS-485

Refer to User's Manual II -- Advanced, Page 12-10

● Allow user to change the station No. of PLC

Description : When the upper byte of R4055 is not equal to 55h，the content
  of R4055 tells the station No. of PLC；

  When the upper byte of R4055 is equal to 55h，the lower byte
  of R4055 is used to set the station No. of PLC。

● Support internal indicator for communication Port 0，Port 1，Port 2

Description : M1970 = 1，it means the Port 0 of PLC has received and replied
  a packet of communication message；
  The ladder program may clear M1970 to detect whether the
  communication is still in progress。
  M1971 = 1，it means the Port 1 of PLC has received and replied
  a packet of communication message；
  The ladder program may clear M1971 to detect whether the
  communication is still in progress。
  M1972 = 1，it means the Port 2 of PLC has received and replied
  a packet of communication message；
  The ladder program may clear M1972 to detect whether the
  communication is still in progress。

☆☆☆ Updating of FBE／FBN OS V3.42   10/16/2000

● Modify the system program to improve the reading of analog inputs while there are more than 2 FB-6AD modules being installed。

● Allow user to change the communication parameter of Port 0
Description : When the upper byte of R4050 is not equal to 55h，the default

              Baud Rate : 9600 ; Data Bit : 7 ; Even Parity ; 1 Stop Bit

          When the upper byte of R4050 is equal to 55h，the lower byte

          of R4050 is used to set the parameter as bellow：

- R4050 = 5500H , Baud Rate= 19200 bps
- R4050 = 5501H , Baud Rate= 9600 bps
- R4050 = 5507H , Baud Rate= 38400 bps

※ Only Baud Rate could be changed and there are 3 choices as above。

※ The procedures to recover Port 0 parameter from being changed：

   a. Turn off the power

   b. Set the 2-bit DIP switch (SW1,built in CPU board) all at ON position

   c. Turn on the power，the content of R4050 must be 0；it means the default value for Port 0

   d. Turn off the power

   e. Set the 2-bit DIP switch at the original position

   f. Turn on the power，the communication parameter of port 0 will be the default as mentioned above

☆☆☆　<u>Updating of FB_E／FB_N OS V3.43</u>　　11/08/2000

● The baud rate of Port 2 is allowed to set as 256000 bps，it meets the protocol of DMX-512；

Set the bits of b0～b3 of R4158 (which is the Port 2 parameter register) all ON，then the baud rate of Port 2 will be 256000 bps。

● Support the Pt-100/Pt-1000 temperature module named FB-2AH4/FB-2AT4 for temperature measurement & control

Refer to User's Manual II -- Advanced, Chapter 20：Temperature measurement of FB-PLC and PID Control

● Remove the OS V3.42's bug，where it is not allowed to save program while PLC is running。

☆☆☆ Updating of FB$_E$／FB$_N$ OS V3.50   1/12/2001

● It allows the user to write the ladder program and data registers into the Flash ROM (the Flash ROM must be placed at the user program socket built in CPU board) directly；it is not necessary to write the Flash ROM via FP-07B。
For long term saving and easy maintenance are the obvious advantages to write the ladder program and data registers into Flash ROM。
Refer to：Write the ladder program and registers into Flash directly

● While CPU link through Modem，it allows to set the count of coming ring for Modem connection。

Setting the content of special register R4163 to meet the requirement：

‧The lower byte of R4163 is used to control the application of X instruction while Modem dialing.

=1, it does not detect dial tone nor busy tone while Modem dialing.

=2, it detects only dial tone but does not detect busy tone while Modem dialing.

=3, it dials directly without detecting dial tone, but will detect busy tone after Modem dialing.

=4, it detects both dial tone and busy tone for Modem dialing.

For the other values, it works as 4.

Different system needs to adjust the setting pertaining to the country.

‧The upper byte of R4163 is used to set the count of coming ring for connection.

=0, 1 coming ring, Modem takes over (system default)

=1, 1 comming ring, Modem takes over

=2, 2 comming ring, Modem takes over

‧

‧

‧

=9, 9 comming ring, Modem takes over

For the value greater than 9，it works as 0.

For example, it needs Modem to take over while the 9th coming ring，the setting as bellow：

R4163=0900H (Set the value in hexdecimal format, it is more easier to set upper byte and lower byte separately)。

☆☆☆ <u>Updating of FBE／FBN OS V3.52</u>　　　　3/20/2001

● Improve the writing of Flash ROM while the CPU board built with Real Time Calendar。

● Remove the bug，where the FUN37(ZCMP) instruction is using the index register V、Z for indirect data access but the execution is not correct。

☆☆☆ <u>Updating of FBE／FBN OS V3.60</u>   7/2/2001

● Support FUN22 (BREAK) : Break and escape from FOR & NEXT loop；
This instruction must be located between FOR & NEXT loop。

 Refer to：Appendix-FUN22-BREAK for detailed description

● Support FUN31 (CRC16) : CRC-16 caculation for Modbus RTU error check。

 Refer to：Appendix-FUN31-CRC16 for detailed description

● Support FUN49 (BUNIT) : Byte unite。

 Refer to：Appendix-FUN49-BUNIT for detailed description

● Support FUN50 (BDIST) : Byte distribute。

 Refer to：Appendix-FUN50-BDIST for detailed description

● Improve the communication quality while CPU link through RS-485 for multi-point connection。

● Modify FUN140 (HSPSO) instruction，where it allows to dynamic change of ouput frequency while the setting of acceleration/deceleration time is 0。

☆☆☆ <u>Updating of FBE／FBN OS V3.61</u>　　　7/10/2001

● It may support up to 4K Hz response for the external input if the ON/OFF duty of the input signal is not as the ratio of 50% / 50%；now it allows the ON/OFF duty of the input signal may vary from 20% / 80%　to 80% / 20%，and the software high speed counter or FUN83(SPD) instruction being used in MA CPU，it may work well if the input frequency does not exceed 4K Hz。

● Support the measurement & control range of Pt-100/Pt-1000 temperature module upto 286.2℃。

Modify the operand Tp of Fun72 & Fun73 instructions，where it allows to input 4 or 5；

Defined as below:

　Tp：Type of sensor
　　　　=0，K Type thermocouple (FB-2AK4 temperature module)
　　　　=1，J Type thermocouple (FB-2AJ4 temperature module)
　　　　=2，Pt-100 RTD (FB-2AH4 temperature module)
　　　　=3，Pt-1000 (FB-2AT4 temperature module)
　　　　=4，Pt-100 (Up to 286℃, FB-2AH4-3 temperature module)
　　　　=5，Pt-1000 (Up to 286℃, FB-2AK4-3 temperature module)

　Refer to User's Manual II -- Advanced, Chapter 20：Temperature measurement of
FB-PLC and PID Control

● Port1 & Port2 of PLC may support Modbus RTU(Slave) communication protocol：

　　R4047 : Upper Byte = 55h，configure the communication port for Modbus RTU protocol；

　　　　　　　　　　 = The other values，Port1 & Port2 don't support Modbus RTU protocol。

　　Lower Byte : Port assignment for Modbus RTU protocol

　　Format as below :

　　Upper Byte　　　　 Lower Byte

55	b7	b6	b5	b4	b3	b2	b1	b0

　　　　　b0, Reserved ;
　　　　　b1=1, Port 1of Modbus RTU protocol;
　　　　　b2=1, Port 2 of Modbus RTU protocol;
　　　　　b3=1, Port 3 of Modbus RTU protocol (Reserved);
　　　　　　·
　　　　　　·
　　　　　　·
　　　　　b7=1, Port 7 of Modbus RTU protocol (Reserved);

　　　　※ It allows to assign multiple ports for Modbus RTU protocol，where the corresponding bit must be ON。

For example:
R4047=5502h, Assign Port 1 of Modbus RTU protocol;
R4047=5504h, Assign Port 2 of Modbus RTU protocol;
R4047=5506h, Assign both Port 1 & Port 2 of Modbus RTU protocol。

　　Refer to：Appendix-Modbus-Fatek，The rule for address mapping between Modbus & Fatek

● Support FUN32 (ADCNV)：Converting the raw value of the 4～20mA analog input into the range of 0～4095(12-bit)，where the input is connecting to the FB-6AD module。

　　Refer to：Appendix-FUN32-ADCNV for detailed description

● Support FUN150 (M-BUS)：The convenient instruction lets PLC act as the master of Modbus RTU communication protocol

　　Refer to：Appendix-FUN150-MBUS for detailed description

●　Modify the Baud Rate settings of Port 2

　　Refer to：Appendix-Port2-Para for detailed description

● The temperature measurement & control may be assigned in Fahrenheit unit (Lower byte of R4009 =1)，not only the Centigrade unit (Lower byte of R4009 =0)。

　　Refer to User's Manual II -- Advanced, Chapter 20：Temperature measurement of FB-PLC and PID Control