BALLUFF

sensors worldwide

Software Description
BIS Electronic Identification System
Software Coupling PROFIBUS DP and Balluff IO - Link Master Module on S7
with BIS M 4__- 045 - ___ - 07 - S4

This function module enables communication between a Balluff Processor
BIS M 4__ - 045 - ... and a Simatic S7 controller.
Depending on the device version used, the following functions are supported:
      Writing code tags
      Reading code tags
      Fill Data Carrier with a constant value
      Head off function

The module must be invoked for each read/write head.

<u>General data:</u>

Module number:	FB35
Instance data module:	(an instance data module must be set up for each head)
Invoked modules:	SFC 14, SFC 15
Reserved markers:	none
Reserved times:	1 time, freely selectable
Reserved counters:	none
Invoke:	Absolute
Device compatibility:	Siemens Simatic S7

Hardware configuration:

The module was designed for using with the Balluff IO - Link Master Module BNI PBS -....
For a detailed description and a list of additional settings, refer to the manual for the BNI - BPS -....
For the processor BIS M 4__ - 045 -... a minimum of 10 byte consistent Input and Output buffer has to be selected.

Settings:

The parameters described here are to be entered both in the processor and as parameters on the function module. For a detailed description and a list of additional settings, refer to the manual for the BIS M 4__ - 045 -....

Parameters

CRC_16 data check: If this function is activated, the correctness of the read or written data is ensured by a CRC_16 data check.

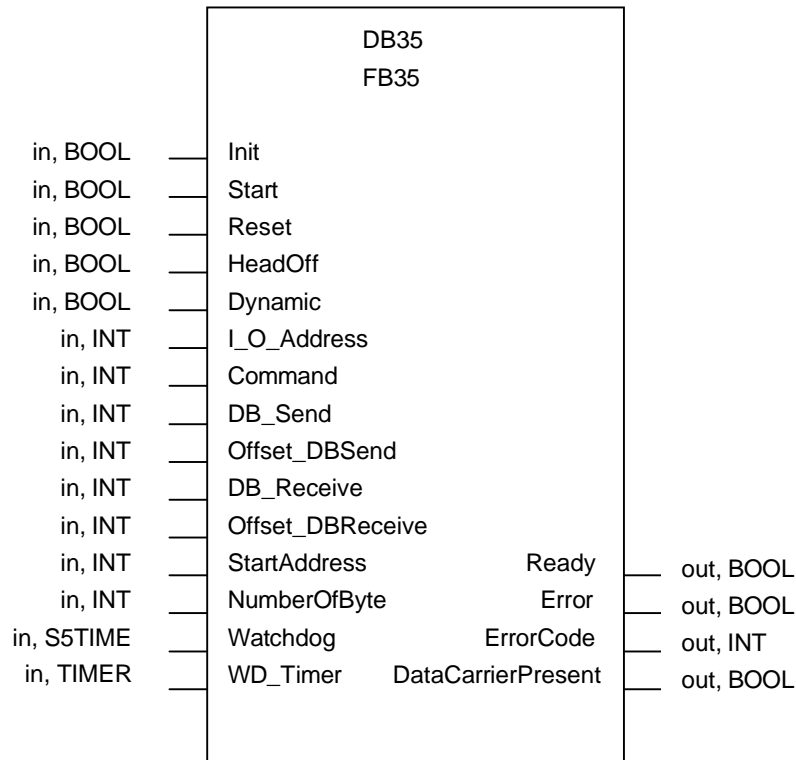0 =   disabled

1 =   enabled

Dynamic Mode: 0 =   a read/write request is rejected with Error No. 1 if there is no code tag within the read/write active zone.

1 =   the read/write request is buffer stored and is not executed until a code tag is recognized.

Function module parameter description:

```
                    ┌──────────────────────────────────┐
                    │              DB35                │
                    │              FB35                │
  in, BOOL    ─────│ Init                             │
  in, BOOL    ─────│ Start                            │
  in, BOOL    ─────│ Reset                            │
  in, BOOL    ─────│ HeadOff                          │
  in, BOOL    ─────│ Dynamic                          │
   in, INT    ─────│ I_O_Address                      │
   in, INT    ─────│ Command                          │
   in, INT    ─────│ DB_Send                          │
   in, INT    ─────│ Offset_DBSend                    │
   in, INT    ─────│ DB_Receive                       │
   in, INT    ─────│ Offset_DBReceive                 │
   in, INT    ─────│ StartAddress          Ready      │───── out, BOOL
   in, INT    ─────│ NumberOfByte          Error      │───── out, BOOL
 in, S5TIME   ─────│ Watchdog              ErrorCode  │───── out, INT
  in, TIMER   ─────│ WD_Timer    DataCarrierPresent   │───── out, BOOL
                    │                                  │
                    └──────────────────────────────────┘
```

Init	Module initialization
	Must be set once each time the PLC is restarted.
Start	Start function
	Start = 1 starts a job.
	The signal must be set until the **Done** parameter goes to 0. The function is done when **Done** or **Error** is set again.
Reset	Reset module and Processor
	Reset = 1 sets the function module and the Processor to the base state.
	The signal must be set until the **Done** parameter goes to 0. The function is done when **Done** is set again.
HeadOff	Head function
	Turn read/write head on/off as needed.

           1 = Active   Read/write head is on.
           0 = Inactive   Read/write head is off.

Dynamic   Dynamic mode
            If the „Dynamic mode" parameter (Byte 2, Bit 5) in the hex
            parameterizing is set, a read or write job may be started without
            requiring that the code tag be in the active zone of the read/write head.
            To prevent time monitoring for the module from being started,
            Dynamic must also be set to 1.

I_O_Address   Start address of the in-/output range of the PLC
            The address may lie in the normal I/O range of the PLC or in the
            peripheral range.

Command   General Job type
                 Job = 01 hex: Read code tag
                 Job = 02 hex: Write code tag
                 Job = 12 hex: Initialize the CRC_16 data check
                            (Proceed like write command 02 hex)
                 Job = 32 hex: Fill code tag with constant value

DB_Send   Data module for write data

Offset_DBSend   Start address for write data in the data module
            The filling constant value (Job 12 hex) is to be set at the first byte

DB_Receive   Data module for read data

Offset_DBReceive Start address of read data in the data module

StartAddress   Start address in the code tag for read or write procedures

NumberOfByte   Length in the code tag for read or write procedures

Watchdog   Monitoring time for read or write procedures

WD_Timer   Timer for monitoring time

Ready   Job completed
            This bit is set when the job was completed without error and not reset
            until a new start edge arrives.

Error   Job completed with error
            This bit is set if the job was completed with an error and is reset with
            Reset or a new **Start** edge.

ErrorCode   If the **Error** bit is set, the error number will be displayed here.

1. General errors

Error No.	Meaning	Effect	Remedy
00	No error.		
01	No code tag present.	Depends on parameter**DYN.**	Check distance between code tag and read/write head.
02	Read error.	Command cancelled. FB and Processor go to base state.	Check distance between code tag and read/write head.
03	Read cancelled because code tag was removed.	Processor and FB go to base state.	Check distance between code tag and read/write head. For dynamic mode: Check velocity.
04	Write error.	Command is cancelled. FB and Processor go to base state. **Caution:** Some data may have already been written to the code tag.	Check distance between code tag and read/write head.
05	Write cancelled because code tag was removed.	Processor and FB got to base state. **Caution:** Some data may have already been written to the code tag.	Check distance between code tag and read/write head. For dynamic mode: Check velocity.
06	Memory access error.	Processor defective.	Repair.
07	Wrong command identifier (**Job**) or number of bytes for a read or write command is 0.	Processor and FB go to base state.	Check parameter settings.
09	Cable break on selected read/write head or head not connected. If both heads are active, one of the heads may not be connected or may be defective.	Processor and FB go to base state.	Check heads.
0C	EEPROM in Processor defective.	Processor and FB go to base state.	Repair.
0D	Communication with code tag interrupted.	Processor and FB go to base state.	Check distance between code tag and read/write head.
0E	The CRC of the read data does not coincide with the CRC of the Data carrier.		
0F	Contents of 1st and 2nd bit array are not equal.	Processor and FB go to base state.	Check programming.
20	Addressing of read/write job is outside the memory range of the data carrier	Processor and FB go to base state.	Check programming.
21	Function invoked which is not possible for the data carrier currently in front of the read/write head	Processor and FB go to base state.	Check programming.

3. FB internal errors

Error No.	Meaning	Effect	Remedy
30	Monitoring time expired.	FB and Processor go to base state.	Correct command specification.
31	Undefined command.	FB and Processor go to base state.	Correct command specification.

DataCarrierPresent Code tag present / data valid
The Processor provides a special function for fast writes:
A positive edge of the Codetag Present signal means data are available starting with address 0 of the code tag in the input buffer of the instance data module without requiring that a read request be initiated. The length of the data is either the set buffer size of the read/write head minus 2 or, if this value is greater than the page length of the code tag, the actual page length of the code tag. Code tags smaller than 2047 bytes have a 32-byte page size, all versions larger than 2047 bytes have a page size of 64 bytes.

For additional information, see equipment manual

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