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Software Description
BIS Electronic Identification System
Software Coupling PROFIBUS DP on S7
with BIS C-60_2, BIS L-60_2, BIS M-60_2 and BIS S-60_2

This function module enables communication between a Balluff Processor BIS C-60_2-..., BIS L-60_2-..., BIS M-60_2-... and BIS S-60_2-... (following BIS X-60_2-…) and a Simatic S7 controller. Depending on the device version used, the following functions are supported:

- Writing code tags with BIS X-60_2-...
- Reading code tags with BIS X-60_2-...
- Initializing code tags for memory optimization only with BIS C-60_2-028-...
- Monitoring initialization only with BIS C-60_2-028-...

When using Processors with 2 read/write heads connected, the module must be invoked for each read/write head.

General data:

Module number:	FB30
Instance data module:	(an instance data module must be set up for each head)
Invoked modules:	none
Reserved markers:	none
Reserved times:	1 time, freely selectable
Reserved counters:	none
Invoke:	Absolute
Device compatibility:	Siemens Simatic S7

Hardware configuration:

Only modules without data consistency may be used with this function module; the data length varies with the number of free available in- and outputs (maximum 128 bytes).

Settings:

The parameters described here are to be entered both in the hex parameterizing on the PROFIBUS Master and as parameters on the function module. For a detailed description and a list of additional settings, refer to the manual for the BIS X-60_2 Processor.

Parameters only for the memory-optimized version BIS C-60_2-028-... :

1st Byte Bit 2: Monitor code tag initialization
If this function is activated, command „9“ must be used to transport the monitoring data to the Processor.

Generally valid parameters :

2nd Byte Bit 5: Dynamic mode for Read/Write Head 1:
- 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.

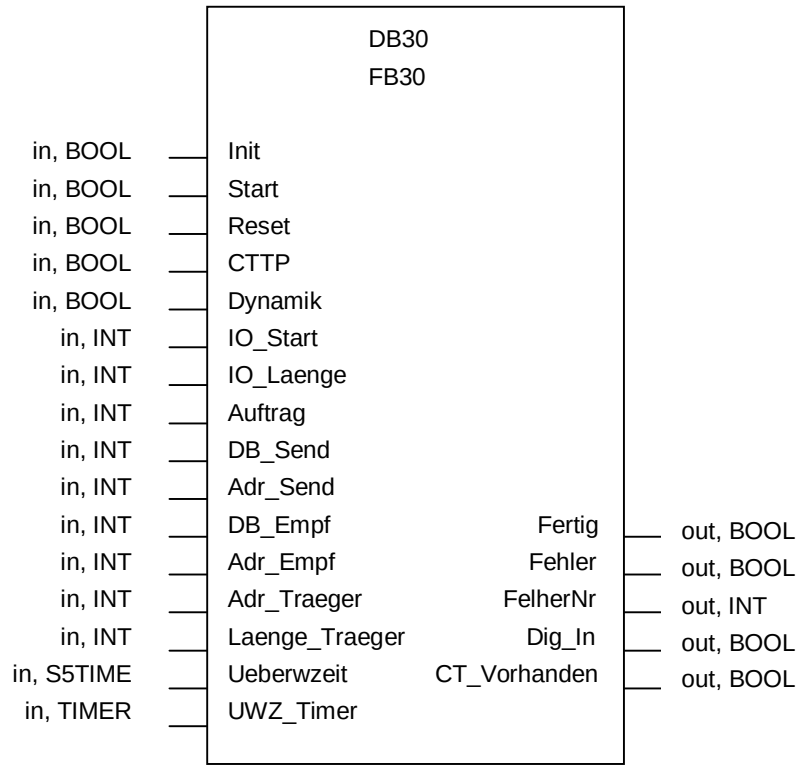
4th Byte Bit 8: Place 2nd bit array at the end of the input and output buffer.
This bit must always be at 1, since for data security reasons the module always demands a 2nd bit array.

5th Byte Bit 5: Dynamic mode on Read/Write Head 2:
- 0= A read/write request is rejected with Error No. 1 of 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.

6th Byte : Number of bytes in the in- and output buffer to be used for Read/Write Head 1 (min. 2 bytes, max. 128 bytes (80H)). The in- and output buffer (on the master) indication refers to both read/write heads, i.e. the size of Read/Write Head 2 represents the difference between the master overall size and the size of Read/Write Head 1.

Example:
Module with 16 words I/O, PLC address 300...331
Length for Head 1 should be 8 bytes, i.e. 6th byte = 08.
IO_Start = 300, **IO_Length** = 8.
The result for Head 2 is a length of 24 bytes, starting with PLC address 308. **IO_Start** = 308, **IO_Length** = 24.

Function module parameter description:



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.

CTTP Code tag type
This parameter specifies the page size of the code tag used:

BIS C-60_2-...

CTTP = 0:	Code tag with 32-byte page size BIS C-1__-02, -03,-04,-05
CTTP = 1:	Code tag with 64-byte page size BIS C-1__-10, -11, -30

BIS S-60_2-...

CTTP = 0: Code tag with 128-byte page size
BIS S-1__-52

CTTP = 1: Code tag with 64-byte page size
BIS S-1__-32, -42

BIS M-60_2-... and BIS L-60_2-…

CTTP = 0: No selection of page size.

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.

IO_Start 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.

IO_Laenge Length of the in-/output range
This parameter must be selected for Head 1 according to the hex parameterizing of Byte 6, or for Head 2 according to the difference between the Master overall size and Byte 6.

Auftrag General job type

Job = 1: Read code tag
Job = 2: Write code tag

Job types only for BIS C-60_2-028-... (see p. 8)

Job = 8: Initialize code tag
Job = 9: Activate monitoring of the code tag initialization

DB_Send Data module for write data

Adr_Send Start address for write data in the data module

DB_Empf Data module for read data

Adr_Empf Start address of read data in the data module

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

Laenge_Traeger Length in the code tag for read or write procedures

Ueberwzeit Monitoring time for read or write procedures

UWZ_Timer Timer for monitoring time

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

Fehler 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.

FehlerNr 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.
0F	Contents of 1st and 2nd bit array are not equal.	Processor and FB go to base state.	Check programming.

2. Error for memory optimized version BIS C-60_2-028-...

Error No.	Meaning	Effect	Remedy
13	Start address + number of bytes > memory range specified in initialization.	FB and Processor go to base state.	Check initialization byte.
14	Invalid max. number of write cycles specified in initialization.	FB and Processor go to base state.	Check initialization byte.
15	Invalid memory size specified in initialization.	FB and Processor go to base state.	Check initialization byte.
16	Max. number of 1 kB exceeded in initialization.	FB and Processor go to base state.	Check initialization byte.
17	Initialization monitoring results in discrepancy.	FB and Processor go to base state.	Check initialization byte. Code tag defective.
18	Code tag not initialized All bytes still 00h.	FB and Processor go to base state.	Initialize code tag.

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.
32	Initialization byte outside permissible limits.	FB and Processor go to base state.	Check initialization bytes.

Dig_In State of the digital input on the Processor
If Bit 7 in Byte 4 of the hex parameterization is set, the state of the digital input is indicated on **Dig_In**.

CT_Vorhanden 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.

BIS C-60_2-028-....

Initializing and monitoring code tags for memory optimization

Before a code tag can be initialized, the 5 bytes for the initialization must be written to the instance data module.
To activate monitoring, the Processor likewise requires the specifications for initialization.

Note the following configuration of the data module:

DBB 178	**à**	Number of the actual memory range on the code tag is automatically set to 00h.
DBB 179	**à**	Code tag memory size $0B_{Hex}$ = 511 bytes $0C_{Hex}$ = 1023 bytes $0D_{Hex}$ = 2047 bytes
DBB 180	**à**	maximum number of write cycles for code tag 01_{Hex} = 100,000 02_{Hex} = 200,000 03_{Hex} = 300,000 04_{Hex} = 400,000 05_{Hex} = 500,000 $0A_{Hex}$ = 1,000,000
DBB 181	**à**	No. of bytes per read/write cycle High-Byte
DBB 182	**à**	No. of bytes per read/write cycle Low-byte

Example:

DBB 181 = 01_{Hex}
DBB 182 = $2F_{Hex}$

This corresponds to $012F_{Hex}$ = 303 bytes

For additional information, see equipment manual

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