

## **DESCRIPTION**

**Example programs for Siemens S7  
F-Control ProfiBus DP/ProfiNet communication  
Protocol no. 20 (FDC\_DP20, FDC\_PN20)**

pk-de / 18.08.2014



**099.0.9884.00-BB-0-GB**

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**Protocol no. 20 (FDC\_DP20, FDC\_PN20)**

**099.0.9884.00-BB-0-GB**

**This documentation is valid for**  
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Version : 0

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099.0.9884.00-BB-0-GB

## Table of content

page

<b>1 Objective .....</b>	<b>3</b>
<b>2 Hardware.....</b>	<b>3</b>
<b>2 .1 ProfiBus DP .....</b>	<b>4</b>
<b>2 .2 ProfiNet.....</b>	<b>5</b>
<b>3 Software.....</b>	<b>6</b>
<b>3 .1 Program Objects.....</b>	<b>7</b>
3 .1.1 Organization Blocks.....	7
3 .1.2 Function Blocks .....	7
3 .1.3 Data Types .....	7
3 .1.4 Variable Tables.....	8
3 .1.5 System Functions .....	8
3 .1.6 OB1 Main Loop .....	9
3 .1.6.1 Inputs of the communication block .....	9
3 .1.6.2 Outputs of the communication block.....	9
3 .1.7 DB20 Communication data .....	10
3 .1.7.1 Write data table (commands and setpoint) .....	11
3 .1.7.2 Read data table (short form) .....	12
3 .1.7.3 Read data table (long form) .....	14
3 .1.7.4 Optional process values .....	14
<b>4 Index history .....</b>	<b>15</b>

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## 1 OBJECTIVE

The programs „FDC\_DP20“ and „FDC\_PN20“ show as examples how a FDC controller can be connected to a ProfiBus DP - or a ProfiNet - network. They also show how to display all transferred data on the S7. The communication function block FB20 used in the example programs takes care of all necessary functions to write data to the FDC and to read data from the FDC. It also monitors the communication. The function block uses the protocol no. 20 for data exchange.

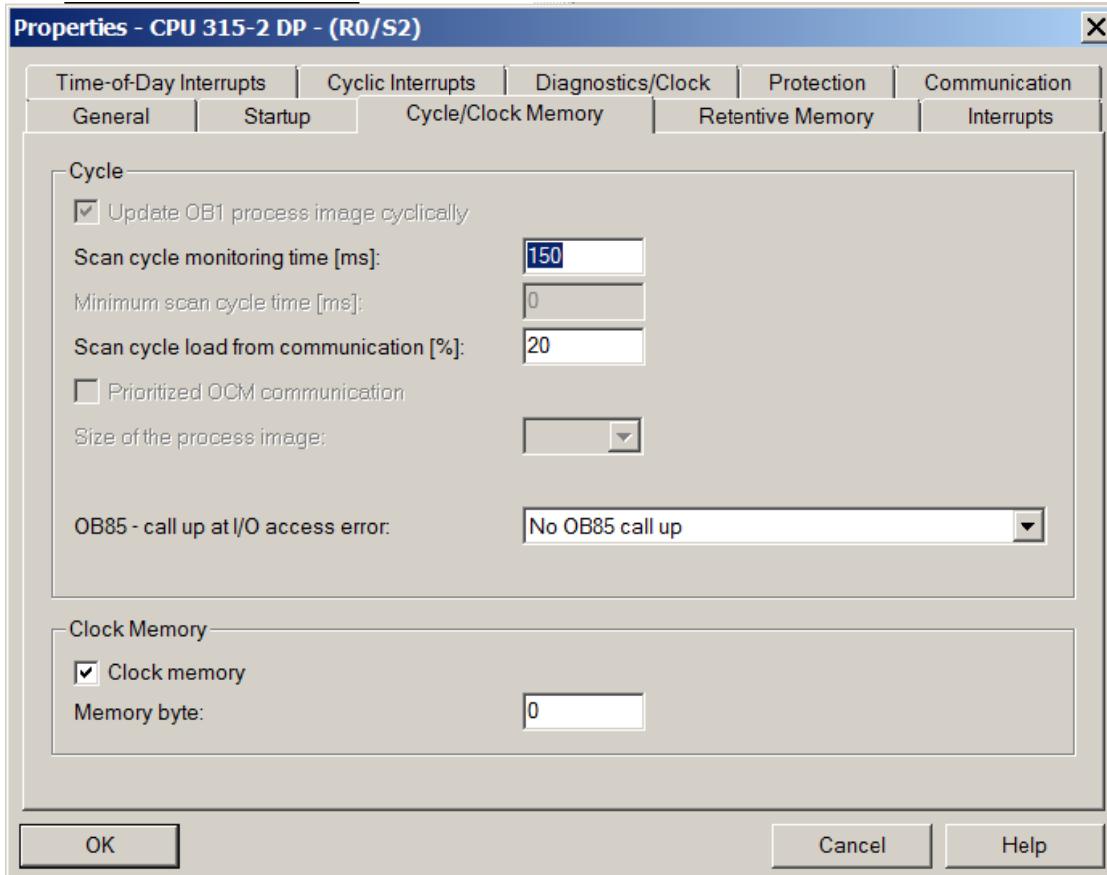
It is left up to the user to copy and use parts of the examples or to program own function blocks for the communication. In any case the user is responsible for the software he is using.

Details of the protocol and of the networks can be read up in following documents:

- 899.470.20.20-SS Interface description data table protocol no. 20
- 899.470.10.02-SS Interface description ProfiBus DP - network
- 899.470.10.05-SS Interface description ProfiNet - network

## 2 HARDWARE

The examples uses Siemens S7-300 PLC's with CPU's with suitable network interfaces. In principle the function blocks can also be used on S7-400 PLC's. The programs are working with the CPU clock memory (MB0) for timer functions. The clock memory must be enabled in the hardware configuration of the CPU.



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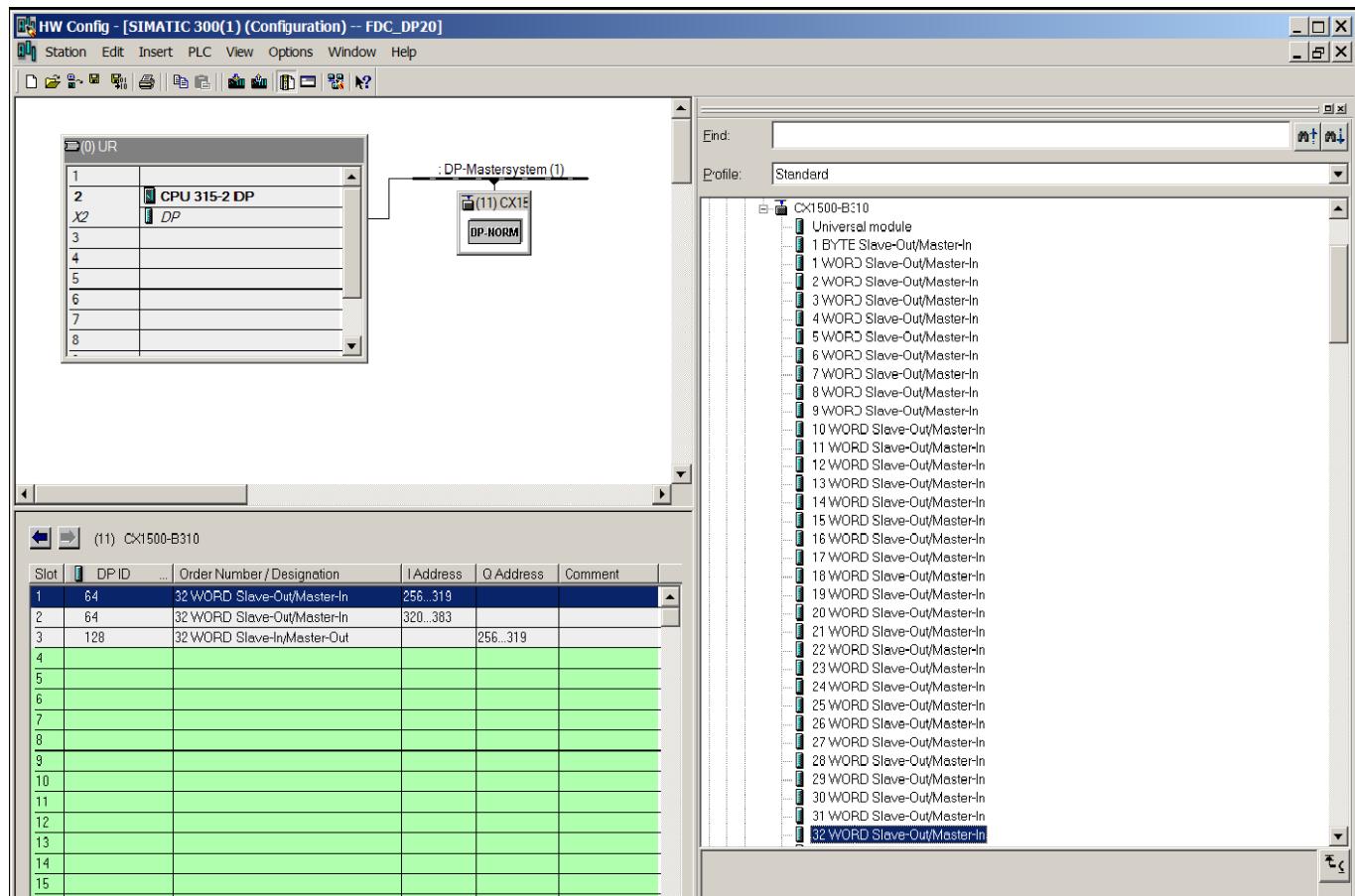
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## 2.1 PROFIBUS DP

The example program „FDC\_DP20.zip“ was written for and tested on a CPU 315-2DP (315-2AG10-0AB0). The necessary GSD - File „FDC\_DP.gsd“ must be installed in the Hardware Catalog.



The protocol no. 20 can be used in a short or long form. See also interface description 899.470.20.20.SS for this.

The short form should be used if address space must be saved. In this case an area of 32 words (64 bytes) is used for reading and writing. For the long (extended) form an additional area of 32 words is used for reading (as displayed above).

In ProfiBus DP - networks the devices are identified by an address number (1-255). In the example the FDC controller is addressed with number 11, which is the standard address.

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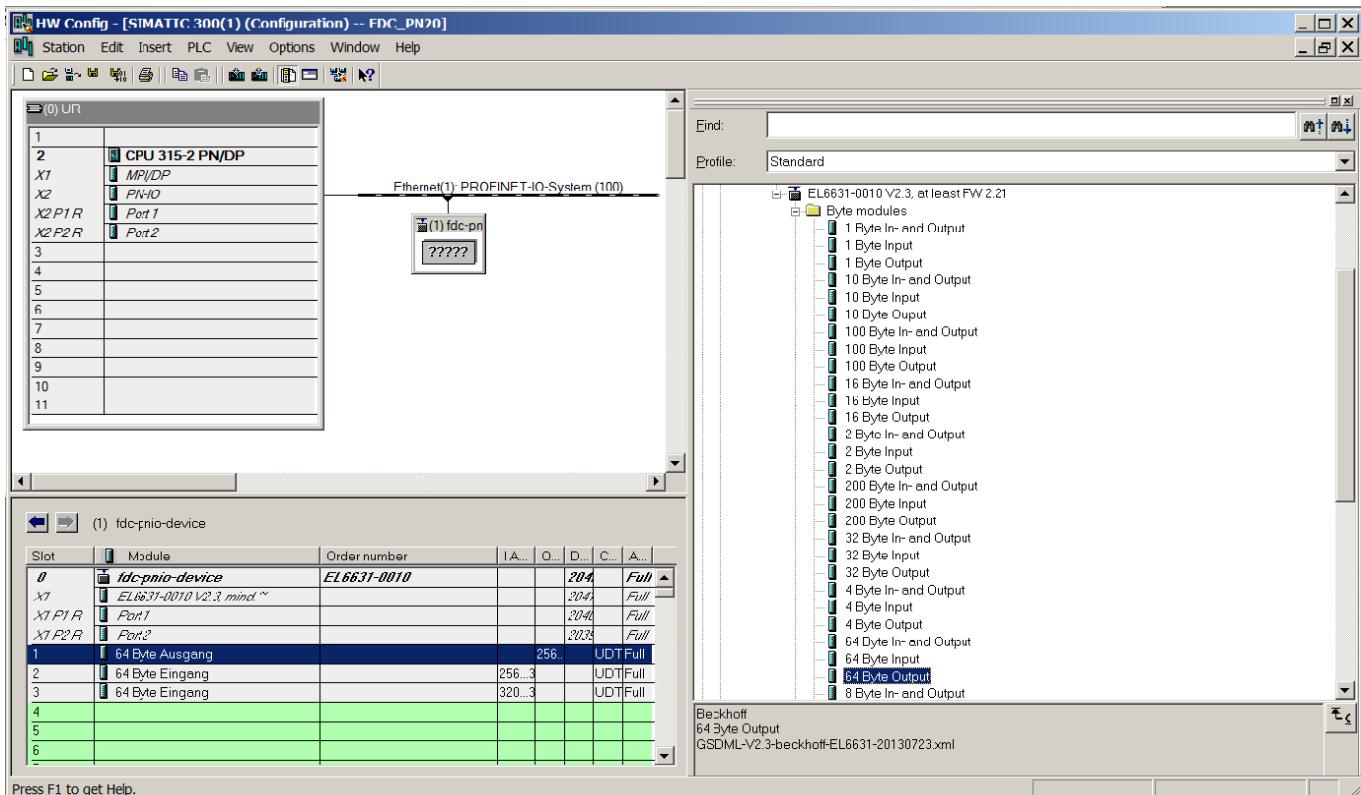
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## 2.2 PROFINET

The example program „FDC\_PN20.zip“ was written for and tested on a CPU 315-2PN/DP (315-2EH14-0AB0). The necessary GSD-File „GSDML-V2.3-beckhoff-EL6631-20130723.xml“ must be installed in the Hardware Catalog.



The protocol no. 20 can be used in a short or long form. See also interface description 899.470.20.20.SS for this.

The short form should be used if address space must be saved. In this case an area of 64 bytes is used for reading and writing. For the long (extended) form an additional area of 64 bytes is used for reading (as displayed above).

In Profinet-networks the devices are identified by names. In the example the FDC controller is addressed with „fdc-pnio-device“, which is the standard name.

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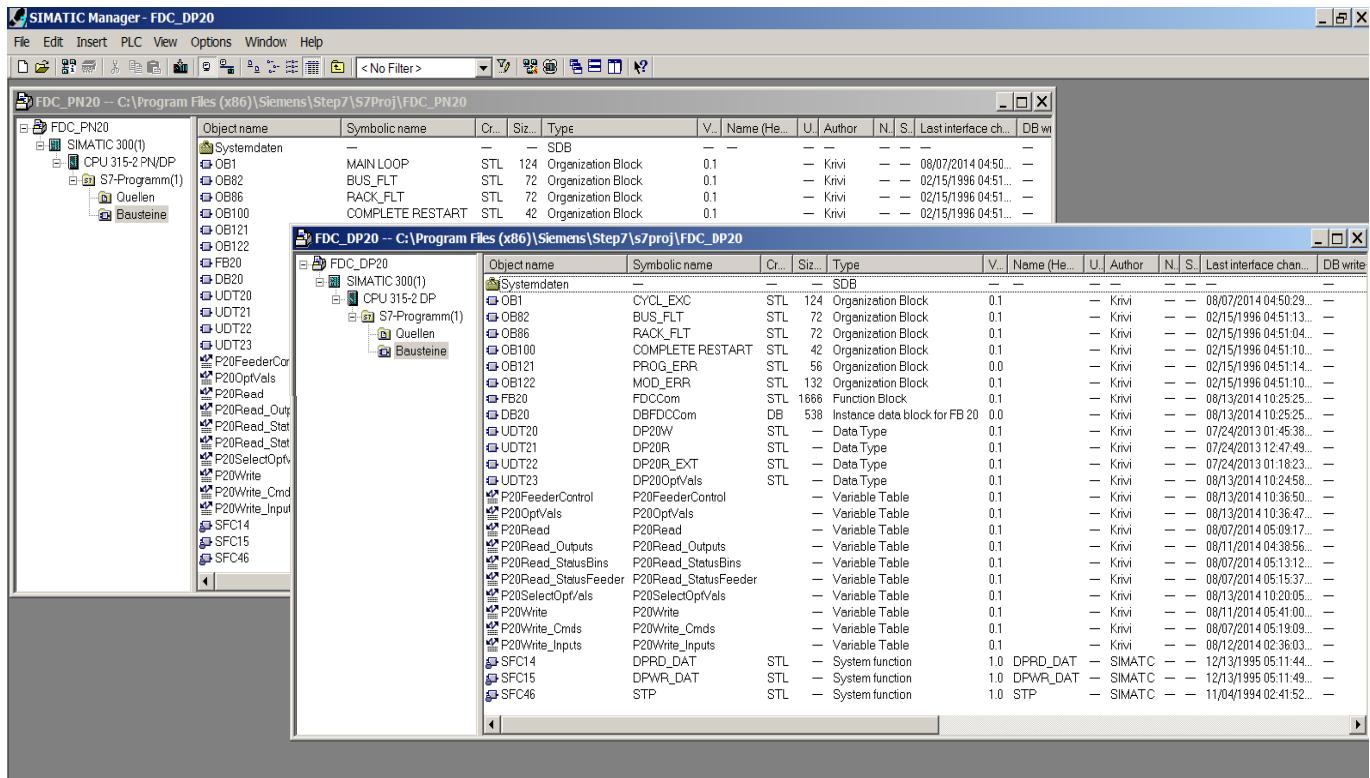
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## 3 SOFTWARE

The two examples for ProfiBus DP and ProfiNet are working with exactly the same program blocks. The only difference is the hardware configuration (see chapter before).



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pk-de / 18.08.2014



099.0.9884.00-BB-0-GB

## 3 .1 PROGRAM OBJECTS

Object name	Symbolic name	Cr...	Siz...	Type
Systemdaten	—	—	—	SDB
OB1	CYCL_EXC	STL	124	Organization Block
OB82	BUS_FLT	STL	72	Organization Block
OB86	RACK_FLT	STL	72	Organization Block
OB100	COMPLETE RESTART	STL	42	Organization Block
OB121	PROG_ERR	STL	56	Organization Block
OB122	MOD_ERR	STL	132	Organization Block
FB20	FDCCCom	STL	1666	Function Block
DB20	DBFDCCCom	DB	538	Instance data block for FB 20
UDT20	DP20W	STL	—	Data Type
UDT21	DP20R	STL	—	Data Type
UDT22	DP20R_EXT	STL	—	Data Type
UDT23	DP20OptVals	STL	—	Data Type
P20FeederControl	P20FeederControl	—	—	Variable Table
P20OptVals	P20OptVals	—	—	Variable Table
P20Read	P20Read	—	—	Variable Table
P20Read_Outputs	P20Read_Outputs	—	—	Variable Table
P20Read_StatusBins	P20Read_StatusBins	—	—	Variable Table
P20Read_StatusFeeder	P20Read_StatusFeeder	—	—	Variable Table
P20SelectOptVals	P20SelectOptVals	—	—	Variable Table
P20Write	P20Write	—	—	Variable Table
P20Write_Cmds	P20Write_Cmds	—	—	Variable Table
P20Write_Inputs	P20Write_Inputs	—	—	Variable Table
SFC14	DPRD_DAT	STL	—	System function
SFC15	DPWR_DAT	STL	—	System function
SFC46	STP	STL	—	System function

### 3 .1.1 Organization Blocks

OB1	Main loop, call of communication function block
OB100	StartUp, the flag M99.7 OB100StartUp is set here on program start and lives one cycle to cause the function blocks to initialize
OB82-122	Failure-OB's

### 3 .1.2 Function Blocks

FB20	FDCCCom	Communication Block
DB20	DBFDCCCom	Communication Data (instance data block for FB20)

### 3 .1.3 Data Types

UDT20	DP20W	Data Definition Write
UDT21	DP20R	Data Definition Read (short form)
UDT22	DP20R_EXT	Data Definition Extended Read (long form)
UDT23	DP20OptVals	Data Definition of the Optional Process Values

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pk-de / 18.08.2014



**099.0.9884.00-BB-0-GB**

### 3 .1.4 Variable Tables

P20FeederControl	All necessary process values, commands and setpoint to control a feeder
P20OptVals	Table of the optional process values
P20Read	All process data read from the FDC controller
P20Read_Outputs	Optional status bits of the feeder
P20Read_StatusBins	Status bits of the prehopper and the silo
P20Read_StatusFeeder	Status bits of the feeder
P20SelectOptVals	Selection of the optional process values
P20Write	All commands and setpoint to the FDC controller
P20Write_Cmds	Display of the commands to the FDC controller
P20Write_Inputs	Display of the additional command bits to the FDC controller

### 3 .1.5 System Functions

SFC14	DPRD_DAT	Reads a memory block consistently from the FDC controller
SFC15	DPWR_DAT	Writes a memory block consistently from the FDC controller
SCF14	STP	Stops the CPU

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pk-de / 18.08.2014



099.0.9884.00-BB-0-GB

### 3.1.6 OB1 Main Loop

Here the call and the parameter passing for the communication block FB20 (FDCCom) takes place.

LAD/STL/FBD - [OB1 -- "CYCL\_EXC" -- FDC\_DP20\SIMATIC 300(1)\CPU 315-2 DP\... \OB1]

File Edit Insert PLC Debug View Options Window Help

Contents Of: 'Environment\Interface\TEMP'

	Name	Data Type	Address	Comment
Interface	OB1_DATE_TIME	Date...	12.0	Date and time OB1 started
TEMP	ComOK	Bool	20.0	

OB1 : "Main Program Sweep (Cycle)"

Comment:

Network 1: FDC Protocol-20

```
// example for communication with an FDC
CALL "FDCCom", "DBFDCCom"
StartUp      := "OB100StartUp"
Pulse100    := "M100MS"
OptValAuto  :=
AdrWrite     := 256
AdrRead      := 256
AdrExtRead   := 320           // 0 for short protocol
SelectOptVal1:=
SelectOptVal2:=
SelectOptVal3:=
SelectOptVal4:=
SelectOptVal5:=
SelectOptVal6:=
SelectOptVal7:=
SelectOptVal8:=
ComOK        := #ComOK
```

FB20 / DB20 -- communication with FDC / data of communication
M99.7 -- S7 startup
M0.0 -- pulse 100 ms

Network 2: Reset StartUp-Flag

```
// this must be the last network of the program !
U    "OB100StartUp"      M99.7      -- S7 startup
R    "OB100StartUp"      M99.7      -- S7 startup
S    "DBFDCCom".OptValAuto  DB20.DBX0.2 -- read all optional values cyclical
```

#### 3.1.6.1 Inputs of the communication block

StartUp	Initialize the function block (memory is cleared)
Pulse100	Pulse 100ms used internally with timers / counters
OptValAuto	Automatic = cyclical selection of <b>all</b> optional process values
AdrWrite	Address of the write memory area (out of the hardware configuration)
AdrRead	Address of the read memory area (out of the hardware configuration)
AdrExtRead	Address of the extended read memory area (out of the hardware configuration) for the long form of protocol no. 20; if the address is set to zero the function block performs the short form of the protocol
SelectOptVal1 .. SelectOptVal8	Direct selection of the optional process values if the cyclical selection (OptValAuto) is disabled

#### 3.1.6.2 Outputs of the communication block

ComOK	The communication is working without failures
-------	---

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pk-de / 18.08.2014



099.0.9884.00-BB-0-GB

## 3 .1.7 DB20 Communication data

	Address	Declaration	Name	Type	Initial value	Comment
1	0.0	in	StartUp	BOOL	FALSE	init data on S7 startup
2	0.1	in	Pulse100	BOOL	FALSE	100ms pulse for timers
3	0.2	in	OptValAuto	BOOL	FALSE	read all optional values cyclical
4	2.0	in	AdrWrite	INT	0	address for write call (out of hardware configuration)
5	4.0	in	AdrRead	INT	0	address for read call (out of hardware configuration)
6	6.0	in	AdrExtRead	INT	0	address for second read call (extended) (out of hardware configuration)
7	8.0	in	SelectOptVal1	BYTE	B#16#0	number of optional value-1 (if cyclical read is not selected)
8	9.0	in	SelectOptVal2	BYTE	B#16#0	number of optional value-2 (if cyclical read is not selected)
9	10.0	in	SelectOptVal3	BYTE	B#16#0	number of optional value-3 (if cyclical read is not selected)
10	11.0	in	SelectOptVal4	BYTE	B#16#0	number of optional value-4 (if cyclical read is not selected)
11	12.0	in	SelectOptVal5	BYTE	B#16#0	number of optional value-5 (if cyclical read is not selected) (extended)
12	13.0	in	SelectOptVal6	BYTE	B#16#0	number of optional value-6 (if cyclical read is not selected) (extended)
13	14.0	in	SelectOptVal7	BYTE	B#16#0	number of optional value-7 (if cyclical read is not selected) (extended)
14	15.0	in	SelectOptVal8	BYTE	B#16#0	number of optional value-8 (if cyclical read is not selected) (extended)
15	16.0	out	ComOK	BOOL	FALSE	no communication fault
16	18.0	stat	WrRetVal	INT	0	return value write function
17	20.0	stat	RdRetVal	INT	0	return value read function
18	22.0	stat	RdExtRetVal	INT	0	return value extended read function
19	24.0	stat	WrOk	BOOL	FALSE	write call was successfull
20	24.1	stat	RdOk	BOOL	FALSE	read call was successfull
21	24.2	stat	RdExtOk	BOOL	FALSE	extended read call was successfull
22	24.3	stat	OptValAutoSave	BOOL	FALSE	copy of OptValAuto to detect changes
23	24.4	stat	P100Save	BOOL	FALSE	copy of Pulse100 to detect changes
24	26.0	stat	ComCnt	INT	0	error counter
25	28.0	stat	Reserve1	ARRAY[1 .. 72]		not used
26	*1.0	stat		BYTE		
27	100.0	stat	WrData	UDT 20		data table to be written to FDC
28	164.0	stat	RdData	UDT 21		data table read from FDC
29	228.0	stat	RdExtData	UDT 22		extended data table read from FDC
30	292.0	stat	OptValues	UDT 23		data table of optional values
31	484.0	stat	Reserve2	ARRAY[1 .. 16]		not used
32	*1.0	stat		BYTE		
33	500.0	stat	DataEnd	INT	0	marks the end of data

The data table that is sent to the FDC controller starts at address 100 (WrData).

The data table for the short form of the protocol that is read from the FDC controller starts at address 164 (RdData) and the additional data table for the long form starts at 228 (RdExtData). The optional process value table starts at 292 (OptValues).

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099.0.9884.00-BB-0-GB

### 3.1.7.1 Write data table (commands and setpoint)

The first 4 bytes (100 – 103) are the telegram header, which is administrated in the communication function block FB20. A monitoring of the communication is realized with the byte "AdministrationNo" of the telegram header which is mirrored in the read data table by the FDC controller. The last 8 bytes (156 – 163) are used for the selection of the optional process values and are also administrated by FB20. The user writes to the commands and setpoint between header and selection (104 - 152)!

Adresse	Deklaration	Name	Typ	Anfangswert	Aktualwert	Kommentar
100.0	stat	WrData.ServiceID	BYTE	B#16#0	B#16#0	Insignificant, number is returned in read protocol
101.0	stat	WrData.AdministrationNo	BYTE	B#16#0	B#16#0	Number is returned in read protocol
102.0	stat	WrData.ProtocolNo	BYTE	B#16#14	B#16#14	Protocol must be 20 !!!
103.0	stat	WrData.NodeNo	BYTE	B#16#0	B#16#0	Node number
104.0	stat	WrData.NDY	DWORD	DW#16#0	DW#16#0	Not defined yet
108.0	stat	WrData.Cmd_24	BOOL	FALSE	FALSE	Command Bit 24
108.1	stat	WrData.Cmd_25	BOOL	FALSE	FALSE	Cmd_25
108.2	stat	WrData.Cmd_26	BOOL	FALSE	FALSE	Cmd_26
108.3	stat	WrData.Cmd_27	BOOL	FALSE	FALSE	Cmd_27
108.4	stat	WrData.Cmd_28	BOOL	FALSE	FALSE	Cmd_28
108.5	stat	WrData.Cmd_29	BOOL	FALSE	FALSE	Cmd_29
108.6	stat	WrData.Cmd_30	BOOL	FALSE	FALSE	Cmd_30
108.7	stat	WrData.Cmd_31	BOOL	FALSE	FALSE	Cmd_31
109.0	stat	WrData.StopOnlineCalibration	BOOL	FALSE	FALSE	Cmd_16 Stop online calibration in remote mode
109.1	stat	WrData.VolumetricModeRefilling	BOOL	FALSE	FALSE	Cmd_17 Set feeder refilling drive to volumetric mode (speed setpoint SY3r)
109.2	stat	WrData.RefillingOffPreHStopper	BOOL	FALSE	FALSE	Cmd_18 Feedback from refill drive. Precondition for online calibration.
109.3	stat	WrData.ReleaseSiloAeration	BOOL	FALSE	FALSE	Cmd_19 General release of aeration
109.4	stat	WrData.SiloAerationPermanent	BOOL	FALSE	FALSE	Cmd_20 Aeration is operated permanently instead of cyclewise (air or gas)
109.5	stat	WrData.SiloAerationSelectionAir	BOOL	FALSE	FALSE	Cmd_21 Selection of aeration media to normal air. Off = inert gas
109.6	stat	WrData.Cmd_22	BOOL	FALSE	FALSE	Cmd_22
109.7	stat	WrData.Cmd_23	BOOL	FALSE	FALSE	Cmd_23
110.0	stat	WrData.VolumetricModeFeeder	BOOL	FALSE	FALSE	Cmd_08 Set feeder drive to volumetric mode (speed setpoint SY1r)
110.1	stat	WrData.VolumetricModePrefeeder	BOOL	FALSE	FALSE	Cmd_09 Set prefeeder drive to volumetric mode (speed setpoint SY2r)
110.2	stat	WrData.AcceptRemoteZeroCorr	BOOL	FALSE	FALSE	Cmd_10 Acceptance of correction value sent from plant control
110.3	stat	WrData.AcceptZeroCorrection	BOOL	FALSE	FALSE	Cmd_11 Acceptance of result (= correction value) of online calibration
110.4	stat	WrData.PreHAerationPermanent	BOOL	FALSE	FALSE	Cmd_12 Aeration is operated permanently instead of cyclewise (air or gas)
110.5	stat	WrData.PreHAerationSelectionAir	BOOL	FALSE	FALSE	Cmd_13 Selection of aeration media to normal air. Off = inert gas
110.6	stat	WrData.ReleasePrehopperAeration	BOOL	FALSE	FALSE	Cmd_14 General release of aeration
110.7	stat	WrData.StartOnlineCalibration	BOOL	FALSE	FALSE	Cmd_15 Start online calibration in remote mode
111.0	stat	WrData.AcknowledgeFailure	BOOL	FALSE	FALSE	Cmd_00 Reset error messages
111.1	stat	WrData.EmptySystem	BOOL	FALSE	FALSE	Cmd_01 Prehopper refilling is stopped and feeding station runs empty
111.2	stat	WrData.RemoteOn	BOOL	FALSE	FALSE	Cmd_02 Remote = full control offeeder from PCS
111.3	stat	WrData.EnableEmptyFeeder	BOOL	FALSE	FALSE	Cmd_03 With next "stop feeding" cmd feeder will run till empty and then stop
111.4	stat	WrData.ResetTotalizer1	BOOL	FALSE	FALSE	Cmd_04 Reset totalizer-1 (FQ1)
111.5	stat	WrData.ResetTotalizer2	BOOL	FALSE	FALSE	Cmd_05 Reset totalizer-2 (FQ2)
111.6	stat	WrData.StartFeeding	BOOL	FALSE	FALSE	Cmd_06 Start feeder in remote operation
111.7	stat	WrData.StopFeeding	BOOL	FALSE	FALSE	Cmd_07 Stop feeder in remote operation
112.0	stat	WrData.E160	BOOL	FALSE	FALSE	E160 Reserved commands CMDr
112.1	stat	WrData.E161	BOOL	FALSE	FALSE	E161
112.2	stat	WrData.E162	BOOL	FALSE	FALSE	E162
112.3	stat	WrData.E163	BOOL	FALSE	FALSE	E163
112.4	stat	WrData.E164	BOOL	FALSE	FALSE	E164
112.5	stat	WrData.E165	BOOL	FALSE	FALSE	E165
112.6	stat	WrData.E166	BOOL	FALSE	FALSE	E166
112.7	stat	WrData.E167	BOOL	FALSE	FALSE	E167

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pk-de / 18.08.2014



**099.0.9884.00-BB-0-GB**

Adresse	Deklaration	Name	Typ	Anfangswert	Aktualwert	Kommentar
113.0	stat	WrData.E150	BOOL	FALSE	FALSE	E150
113.1	stat	WrData.E151	BOOL	FALSE	FALSE	E151
113.2	stat	WrData.E152	BOOL	FALSE	FALSE	E152
113.3	stat	WrData.E153	BOOL	FALSE	FALSE	E153
113.4	stat	WrData.E154	BOOL	FALSE	FALSE	E154
113.5	stat	WrData.E155	BOOL	FALSE	FALSE	E155
113.6	stat	WrData.E156	BOOL	FALSE	FALSE	E156
113.7	stat	WrData.E157	BOOL	FALSE	FALSE	E157
114.0	stat	WrData.E140	BOOL	FALSE	FALSE	E140
114.1	stat	WrData.E141	BOOL	FALSE	FALSE	E141
114.2	stat	WrData.E142	BOOL	FALSE	FALSE	E142
114.3	stat	WrData.E143	BOOL	FALSE	FALSE	E143
114.4	stat	WrData.E144	BOOL	FALSE	FALSE	E144
114.5	stat	WrData.E145	BOOL	FALSE	FALSE	E145
114.6	stat	WrData.E146	BOOL	FALSE	FALSE	E146
114.7	stat	WrData.E147	BOOL	FALSE	FALSE	E147
115.0	stat	WrData.E130	BOOL	FALSE	FALSE	E130
115.1	stat	WrData.E131	BOOL	FALSE	FALSE	E131
115.2	stat	WrData.E132	BOOL	FALSE	FALSE	E132
115.3	stat	WrData.E133	BOOL	FALSE	FALSE	E133
115.4	stat	WrData.E134	BOOL	FALSE	FALSE	E134
115.5	stat	WrData.E135	BOOL	FALSE	FALSE	E135
115.6	stat	WrData.E136	BOOL	FALSE	FALSE	E136
115.7	stat	WrData.E137	BOOL	FALSE	FALSE	E137
116.0	stat	WrData.SetpointOfFeedrate	REAL	0.000000e+000	0.000000e+000	FY1 feedrate setpoint used in remote mode
120.0	stat	WrData.RemoteCorrection	REAL	0.000000e+000	0.000000e+000	QY1r Correction of zero sent from plant control. To be made valid by command
124.0	stat	WrData.SetpointLoadingQuantity	REAL	0.000000e+000	0.000000e+000	QYL Loading mass setpoint (used for loading operations)
128.0	stat	WrData.SpeedSetpFeederDrive	REAL	0.000000e+000	0.000000e+000	SY1r Speed setpoint valid in volumetric mode for feeder drive
132.0	stat	WrData.SpeedSetpPrefeederDrive	REAL	0.000000e+000	0.000000e+000	SY2r Speed setpoint valid in volumetric mode for prefedeer drive
136.0	stat	WrData.SpeedSetpRefillingDrive	REAL	0.000000e+000	0.000000e+000	SY3r Speed setpoint valid in volumetric mode for refilling drive
140.0	stat	WrData.FreeValue1	REAL	0.000000e+000	0.000000e+000	Not yet defined
144.0	stat	WrData.FreeValue2	REAL	0.000000e+000	0.000000e+000	Not yet defined
148.0	stat	WrData.VAR53	REAL	0.000000e+000	0.000000e+000	Reserved value VAR53
152.0	stat	WrData.VAR59	REAL	0.000000e+000	0.000000e+000	Reserved value VAR59
156.0	stat	WrData.SelectOptionalReadVal1	BYTE	B#16#0	B#16#0	Number of optional read value
157.0	stat	WrData.SelectOptionalReadVal2	BYTE	B#16#0	B#16#0	Number of optional read value
158.0	stat	WrData.SelectOptionalReadVal3	BYTE	B#16#0	B#16#0	Number of optional read value
159.0	stat	WrData.SelectOptionalReadVal4	BYTE	B#16#0	B#16#0	Number of optional read value
160.0	stat	WrData.SelectOptionalReadVal5	BYTE	B#16#0	B#16#0	Number of optional read value
161.0	stat	WrData.SelectOptionalReadVal6	BYTE	B#16#0	B#16#0	Number of optional read value
162.0	stat	WrData.SelectOptionalReadVal7	BYTE	B#16#0	B#16#0	Number of optional read value
163.0	stat	WrData.SelectOptionalReadVal8	BYTE	B#16#0	B#16#0	Number of optional read value

### 3.1.7.2 Read data table (short form)

The user has read access to this data table!

Adresse	Deklaration	Name	Typ	Anfangswert	Aktualwert	Kommentar
164.0	stat	RdData.ServiceID	BYTE	B#16#1	B#16#1	Insignificant,from write protocol
165.0	stat	RdData.AdministrationNo	BYTE	B#16#0	B#16#0	Number from write protocol
166.0	stat	RdData.ProtocolNo	BYTE	B#16#14	B#16#14	Protocol must be 20 !!!
167.0	stat	RdData.NodeNo	BYTE	B#16#0	B#16#0	Node number
168.0	stat	RdData.HostAddress	DWORD	DW#16#0	DW#16#0	Network address of host system = client
172.0	stat	RdData.ErrorDevice	DWORD	DW#16#0	DW#16#0	ERR Device indicating error
176.0	stat	RdData.PresentError	DWORD	DW#16#0	DW#16#0	ERR Error number
180.0	stat	RdData.SIF_24	BOOL	FALSE	FALSE	SIF_24 Status Feeder Bit 24
180.1	stat	RdData.SIF_25	BOOL	FALSE	FALSE	SIF_25
180.2	stat	RdData.SIF_26	BOOL	FALSE	FALSE	SIF_26
180.3	stat	RdData.SIF_27	BOOL	FALSE	FALSE	SIF_27
180.4	stat	RdData.SIF_28	BOOL	FALSE	FALSE	SIF_28
180.5	stat	RdData.SIF_29	BOOL	FALSE	FALSE	SIF_29
180.6	stat	RdData.SIF_30	BOOL	FALSE	FALSE	SIF_30
180.7	stat	RdData.SIF_31	BOOL	FALSE	FALSE	SIF_31
181.0	stat	RdData.FeederSlideGateFault	BOOL	FALSE	FALSE	SIF_16 Slide gate above feeder is not in required position
181.1	stat	RdData.FeederSlideGateOpen	BOOL	FALSE	FALSE	SIF_17 Slide gate above feeder is open
181.2	stat	RdData.PrefeederFault	BOOL	FALSE	FALSE	SIF_18 Fault of prefeeder
181.3	stat	RdData.PrefeederRunning	BOOL	FALSE	FALSE	SIF_19 Prefeeder is running
181.4	stat	RdData.LoadingQuantityReached	BOOL	FALSE	FALSE	SIF_20 Loading cycle finished (only with loading application)
181.5	stat	RdData.SIF_21	BOOL	FALSE	FALSE	SIF_21 Status Feeder Bit 21
181.6	stat	RdData.SIF_22	BOOL	FALSE	FALSE	SIF_22
181.7	stat	RdData.SIF_23	BOOL	FALSE	FALSE	SIF_23

# DESCRIPTION

**Example programs for Siemens S7  
F-Control ProfiBus DP/ProfiNet communication  
Protocol no. 20 (FDC\_DP20, FDC\_PN20)**

pk-de / 18.08.2014



**099.0.9884.00-BB-0-GB**

Adresse	Deklaration	Name	Typ	Anfangswert	Aktualwert	Kommentar
182.0	stat	RdData.FaultFeeder	BOOL	FALSE	FALSE	StF_08 Fault of feeder
182.1	stat	RdData.FeedingStarted	BOOL	FALSE	FALSE	StF_09 Feeder is in operation
182.2	stat	RdData.RunningBackward	BOOL	FALSE	FALSE	StF_10 Direction of feeder drive = backward
182.3	stat	RdData.RunningForward	BOOL	FALSE	FALSE	StF_11 Direction of feeder drive = forward (feeding direction)
182.4	stat	RdData.LoadingAboveLowerLimit	BOOL	FALSE	FALSE	StF_12 Loading of feeder higher than low level WL1
182.5	stat	RdData.LoadingAboveUpperLimit	BOOL	FALSE	FALSE	StF_13 Loading of feeder higher than high level WH1
182.6	stat	RdData.LoadingBelowEmptyLimit	BOOL	FALSE	FALSE	StF_14 Loading of feeder lower than empty WLL1
182.7	stat	RdData.FeedSlideGateClosed	BOOL	FALSE	FALSE	StF_15 Slide gate above feeder is closed
183.0	stat	RdData.ControlVoltageOK	BOOL	FALSE	FALSE	StF_00 Control voltage generation in cabinet is ok
183.1	stat	RdData.NotEmergencyStop	BOOL	FALSE	FALSE	StF_01 Emergency stop hardwired input is not active
183.2	stat	RdData.StartIsReleased	BOOL	FALSE	FALSE	StF_02 Start is released via hardwired input
183.3	stat	RdData.AutomaticMode	BOOL	FALSE	FALSE	StF_03 Feeder is in Remote (valid also in volumetric mode). Ctrl only via PCS
183.4	stat	RdData.FieldMode	BOOL	FALSE	FALSE	StF_04 Feeder is in Field mode. Control only via FLP
183.5	stat	RdData.LocalMode	BOOL	FALSE	FALSE	StF_05 Feeder is in Local mode. Control via panel and/or FLP
183.6	stat	RdData.VolumetricModeActive	BOOL	FALSE	FALSE	StF_06 Volumetric mode is selected for one of the drives
183.7	stat	RdData.AdjustModeActive	BOOL	FALSE	FALSE	StF_07 For service purposes speed is freezed as long as this signal is high
184.0	stat	RdData.SiloAerationActive	BOOL	FALSE	FALSE	StB_24 Aeration in silo cone is released
184.1	stat	RdData.SiloAerationFault	BOOL	FALSE	FALSE	StB_25 Aeration in silo cone is faulty (power to valves)
184.2	stat	RdData.RefillSlideGateClosed	BOOL	FALSE	FALSE	StB_26 Slide gate above prehopper is closed
184.3	stat	RdData.bRefillSlideGateFault	BOOL	FALSE	FALSE	StB_27 Fault in slide gate sequence
184.4	stat	RdData.RefillSlideGateOpen	BOOL	FALSE	FALSE	StB_28 Slide gate above prehopper is open
184.5	stat	RdData.StB_29	BOOL	FALSE	FALSE	StB_29 Status Bins Bit 29
184.6	stat	RdData.StB_30	BOOL	FALSE	FALSE	StB_30
184.7	stat	RdData.StB_31	BOOL	FALSE	FALSE	StB_31
185.0	stat	RdData.FlapGateClosed	BOOL	FALSE	FALSE	StB_16 Flap above prehopper is closed
185.1	stat	RdData.FlapGateFault	BOOL	FALSE	FALSE	StB_17 Fault in flap sequence
185.2	stat	RdData.FlapGateOpen	BOOL	FALSE	FALSE	StB_18 Flap above prehopper is open
185.3	stat	RdData.SiloLevelAboveHighLimit	BOOL	FALSE	FALSE	StB_19 Level in silo higher than high level
185.4	stat	RdData.SiloLevelAboveMaximum	BOOL	FALSE	FALSE	StB_20 Level in silo higher than max level
185.5	stat	RdData.SiloLevelBelowLowerLimit	BOOL	FALSE	FALSE	StB_21 Level in silo lower than low level
185.6	stat	RdData.SiloLevelBelowMinimum	BOOL	FALSE	FALSE	StB_22 Level in silo lower than min level
185.7	stat	RdData.SiloLevelFault	BOOL	FALSE	FALSE	StB_23 Fault in silo level measurement
186.0	stat	RdData.OLCFault	BOOL	FALSE	FALSE	StB_08 Fault in online calibration
186.1	stat	RdData.OLCFinished	BOOL	FALSE	FALSE	StB_09 Online calibration has finished
186.2	stat	RdData.OLCRunning	BOOL	FALSE	FALSE	StB_10 Online calibration is in operation
186.3	stat	RdData.OLCStarted	BOOL	FALSE	FALSE	StB_11 Online calibration has started
186.4	stat	RdData.AgitatorFault	BOOL	FALSE	FALSE	StB_12 Fault in agitator sequence
186.5	stat	RdData.AgitatorRunning	BOOL	FALSE	FALSE	StB_13 Agitator is in operation
186.6	stat	RdData.RefillingFault	BOOL	FALSE	FALSE	StB_14 Fault in refilling sequence
186.7	stat	RdData.RefillingRunning	BOOL	FALSE	FALSE	StB_15 Refilling of prehopper is in operation
187.0	stat	RdData.PreHLevelAboveHighLimit	BOOL	FALSE	FALSE	StB_00 Level in prehopper higher than high level. OLC can be started
187.1	stat	RdData.PreHLevelAboveMaximum	BOOL	FALSE	FALSE	StB_01 Level in prehopper higher than max level. Refilling will be aborted
187.2	stat	RdData.PreHLevelBelowLowerLimit	BOOL	FALSE	FALSE	StB_02 Level in prehopper lower than low level. OLC will be aborted
187.3	stat	RdData.PreHLevelBelowMinimum	BOOL	FALSE	FALSE	StB_03 Level in prehopper lower than min level. Feeding will be influenced
187.4	stat	RdData.PreHLevelFault	BOOL	FALSE	FALSE	StB_04 Fault in prehopper level measurement
187.5	stat	RdData.PreHLevelMaxProbe	BOOL	FALSE	FALSE	StB_05 Max probe has detected volumetric max level(Recalculation level limits)
187.6	stat	RdData.PreHaerationActive	BOOL	FALSE	FALSE	StB_06 Aeration in prehopper cone is released
187.7	stat	RdData.PreHaerationFault	BOOL	FALSE	FALSE	StB_07 Aeration in prehopper cone is faulty (power to valves)
188.0	stat	RdData.FeedRate	REAL	0.000000e+000	0.000000e+000	F11 Real feed rate
192.0	stat	RdData.SpeedWeighFeederDrive	REAL	0.000000e+000	0.000000e+000	St1 Real speed of feeder
196.0	stat	RdData.RelativeLoadAtDischarge	REAL	0.000000e+000	0.000000e+000	W1a Real load of feeder relative to nominal load
200.0	stat	RdData.Totalizer1	REAL	0.000000e+000	0.000000e+000	FQ1 Short time integral of real feed rate
204.0	stat	RdData.PrehopperLevel	REAL	0.000000e+000	0.000000e+000	L13 Level in Prehopper as weight
208.0	stat	RdData.DifferenceOfOLC	REAL	0.000000e+000	0.000000e+000	WD1 Difference of fed quantity FQ3 and weighed quantity W13
212.0	stat	RdData.OptionalReadValue1	REAL	0.000000e+000	0.000000e+000	Optional read value as selected in write table
216.0	stat	RdData.OptionalReadValue2	REAL	0.000000e+000	0.000000e+000	Optional read value as selected in write table
220.0	stat	RdData.OptionalReadValue3	REAL	0.000000e+000	0.000000e+000	Optional read value as selected in write table
224.0	stat	RdData.OptionalReadValue4	REAL	0.000000e+000	0.000000e+000	Optional read value as selected in write table

# DESCRIPTION

## Example programs for Siemens S7 F-Control ProfiBus DP/ProfiNet communication Protocol no. 20 (FDC\_DP20, FDC\_PN20)

pk-de / 18.08.2014



099.0.9884.00-BB-0-GB

### 3.1.7.3 Read data table (long form)

This data table is only valid if the long form of the protocol is used.

The user has read access to this data table!

Adresse	Deklaration	Name	Typ	Anfangswert	Aktualwert	Kommentar
228.0	stat	RdExtData.PresentCorrectionValue	REAL	0.000000e+000	0.000000e+000	QY1 Result of last online calibration
232.0	stat	RdExtData.CurrentOfFeeder	REAL	0.000000e+000	0.000000e+000	I1 Real current of feeder motor
236.0	stat	RdExtData.LoadAtDischarge	REAL	0.000000e+000	0.000000e+000	W1a Real load of feeder at discharge
240.0	stat	RdExtData.RelativeLoadAtMeasuring	REAL	0.000000e+000	0.000000e+000	W1 Relative loading at measuring related to nominal load
244.0	stat	RdExtData.Totalizer2	REAL	0.000000e+000	0.000000e+000	FQ2 Long time integral of real feed rate
248.0	stat	RdExtData.CurrentOfPrefeeder	REAL	0.000000e+000	0.000000e+000	I2 Real current of prefeeder motor
252.0	stat	RdExtData.SetpointOfPrefeeder	REAL	0.000000e+000	0.000000e+000	SY2/GY2 Real speed (position) setpoint to prefeeder drive
256.0	stat	RdExtData.FeedbackOfPrefeeder	REAL	0.000000e+000	0.000000e+000	SI2/GI2 Real speed (position) of prefeeder
260.0	stat	RdExtData.CurrentOfRefilling	REAL	0.000000e+000	0.000000e+000	I3 Real current of refilling motor
264.0	stat	RdExtData.SetpointOfRefilling	REAL	0.000000e+000	0.000000e+000	SY3/GY3 Real speed (position) setpoint to refilling drive
268.0	stat	RdExtData.FeedbackOfRefilling	REAL	0.000000e+000	0.000000e+000	SI3/GI3 Real speed (position) of refilling
272.0	stat	RdExtData.LevelOfMaterialInSilo	REAL	0.000000e+000	0.000000e+000	L14 Level in silo as weight
276.0	stat	RdExtData.OptionalReadValue5	REAL	0.000000e+000	0.000000e+000	Optional read value as selected in write table
280.0	stat	RdExtData.OptionalReadValue6	REAL	0.000000e+000	0.000000e+000	Optional read value as selected in write table
284.0	stat	RdExtData.OptionalReadValue7	REAL	0.000000e+000	0.000000e+000	Optional read value as selected in write table
288.0	stat	RdExtData.OptionalReadValue8	REAL	0.000000e+000	0.000000e+000	Optional read value as selected in write table

### 3.1.7.4 Optional process values

If the cyclical selection of all process values (OptValAuto) is enabled the whole data table is valid. Otherwise only the process values are valid which are selected directly at the inputs of FB20.

The user has read access to this data table!

Adresse	Deklaration	Name	Typ	Anfangswert	Aktualwert	Kommentar
292.0	stat	OptValues.O1_FeederConfig	DWORD	DW#16#0	DW#16#0	opt.val 01 = feeder configuration
296.0	stat	OptValues.O2_PrefeederConfig	DWORD	DW#16#0	DW#16#0	opt.val 02 = prefeeder configuration
300.0	stat	OptValues.O3_FeederDriveCtrlVal	REAL	0.000000e+000	0.000000e+000	opt.val 03 = SY1 control value of weigh feeder drive
304.0	stat	OptValues.O4_PresentCorrectionVal	REAL	0.000000e+000	0.000000e+000	opt.val 04 = QY1 correction value of zero value of weigh feeder
308.0	stat	OptValues.O5_CurrentOfFeeder	REAL	0.000000e+000	0.000000e+000	opt.val 05 = I1 current of weigh feeder motor
312.0	stat	OptValues.O6_AbsLoadingAtDischarge	REAL	0.000000e+000	0.000000e+000	opt.val 06 = W1a real value of loading at discharge point
316.0	stat	OptValues.O7_Rel>LoadingAtMeasuring	REAL	0.000000e+000	0.000000e+000	opt.val 07 = W1 relative loading at measuring point
320.0	stat	OptValues.O8_SetpointOfFeedrate	REAL	0.000000e+000	0.000000e+000	opt.val 08 = FY1 setpoint of feedrate
324.0	stat	OptValues.O9_Totalizer2	REAL	0.000000e+000	0.000000e+000	opt.val 09 = FQ2 long time integral memory of real feed rate
328.0	stat	OptValues.O10_ResidualQuantity	REAL	0.000000e+000	0.000000e+000	opt.val 10 = QIL loading residual quantity
332.0	stat	OptValues.O11_SetpointLoadingQuantity	REAL	0.000000e+000	0.000000e+000	opt.val 11 = QYL setpoint loading quantity
336.0	stat	OptValues.O12_CurrentOfPrefeeder	REAL	0.000000e+000	0.000000e+000	opt.val 12 = I2 current of motor of prefeeder
340.0	stat	OptValues.O13_DynSetpointOfLoading	REAL	0.000000e+000	0.000000e+000	opt.val 13 = WY1d dynamic setpoint of loading at infeed point of weigh feeder
344.0	stat	OptValues.O14_FeedrateOfPrefeeder	REAL	0.000000e+000	0.000000e+000	opt.val 14 = F12 feedrate of prefeeder
348.0	stat	OptValues.O15_SetpointOfPrefeeder	REAL	0.000000e+000	0.000000e+000	opt.val 15 = SY2/GY2 setpoint of speed / position of prefeeder
352.0	stat	OptValues.O16_FeedbackOfPrefeeder	REAL	0.000000e+000	0.000000e+000	opt.val 16 = SI2/GI2 real value of speed / position of prefeeder
356.0	stat	OptValues.O17_CurrentOfRefilling	REAL	0.000000e+000	0.000000e+000	opt.val 17 = I3 current of refilling motor
360.0	stat	OptValues.O18_FeedrateOfRefilling	REAL	0.000000e+000	0.000000e+000	opt.val 18 = FI3 discharge capacity of refilling drive
364.0	stat	OptValues.O19_LastCorrectionValue	REAL	0.000000e+000	0.000000e+000	opt.val 19 = QY1a last correction value of zero value
368.0	stat	OptValues.O20_NominalCheckQuantity	REAL	0.000000e+000	0.000000e+000	opt.val 20 = WY3 nominal check quantity
372.0	stat	OptValues.O21_LevelSetpointOfPrehopper	REAL	0.000000e+000	0.000000e+000	opt.val 21 = LY3 present setpoint of level in prehopper
376.0	stat	OptValues.O22_PressureForce	REAL	0.000000e+000	0.000000e+000	opt.val 22 = PI3 pressure force
380.0	stat	OptValues.O23_QuantFedOverFeeder	REAL	0.000000e+000	0.000000e+000	opt.val 23 = FQ3 quantity fed over weigh feeder
384.0	stat	OptValues.O24_RemoteCorrection	REAL	0.000000e+000	0.000000e+000	opt.val 24 = QY1r remote correction
388.0	stat	OptValues.O25_SetpointOfRefilling	REAL	0.000000e+000	0.000000e+000	opt.val 25 = SY3/GY3 setpoint of speed / position of refilling drive
392.0	stat	OptValues.O26_FeedbackOfRefilling	REAL	0.000000e+000	0.000000e+000	opt.val 26 = SI3/GI3 real value of speed / position of refilling drive
396.0	stat	OptValues.O27_TotalCorrection	REAL	0.000000e+000	0.000000e+000	opt.val 27 = ID31.54 total zero correction
400.0	stat	OptValues.O28_WeighedQuantity	REAL	0.000000e+000	0.000000e+000	opt.val 28 = WI3 weighed quantity extracted from prehopper
404.0	stat	OptValues.O29_SiloLevel	REAL	0.000000e+000	0.000000e+000	opt.val 29 = L14 level of material in silo
408.0	stat	OptValues.O30_VAR52	REAL	0.000000e+000	0.000000e+000	opt.val 30 = RV1 reserve value 1 (Pr10 VAR52)
412.0	stat	OptValues.O31_VAR60	REAL	0.000000e+000	0.000000e+000	opt.val 31 = RV2 reserve value 2 (Pr10 VAR60)

# DESCRIPTION

**Example programs for Siemens S7  
F-Control ProfiBus DP/ProfiNet communication  
Protocol no. 20 (FDC\_DP20, FDC\_PN20)**

pk-de / 18.08.2014



**099.0.9884.00-BB-0-GB**

Adresse	Deklaration	Name	Typ	Anfangswert	Aktualwert	Kommentar
416.0	stat	OptValues.O32_A150	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A150)
416.1	stat	OptValues.O32_A151	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A151)
416.2	stat	OptValues.O32_A152	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A152)
416.3	stat	OptValues.O32_A153	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A153)
416.4	stat	OptValues.O32_A154	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A154)
416.5	stat	OptValues.O32_A155	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A155)
416.6	stat	OptValues.O32_A156	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A156)
416.7	stat	OptValues.O32_A157	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A157)
417.0	stat	OptValues.O32_A140	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A140)
417.1	stat	OptValues.O32_A141	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A141)
417.2	stat	OptValues.O32_A142	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A142)
417.3	stat	OptValues.O32_A143	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A143)
417.4	stat	OptValues.O32_A144	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A144)
417.5	stat	OptValues.O32_A145	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A145)
417.6	stat	OptValues.O32_A146	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A146)
417.7	stat	OptValues.O32_A147	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A147)
418.0	stat	OptValues.O32_A130	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A130)
418.1	stat	OptValues.O32_A131	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A131)
418.2	stat	OptValues.O32_A132	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A132)
418.3	stat	OptValues.O32_A133	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A133)
418.4	stat	OptValues.O32_A134	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A134)
418.5	stat	OptValues.O32_A135	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A135)
418.6	stat	OptValues.O32_A136	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A136)
418.7	stat	OptValues.O32_A137	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A137)
419.0	stat	OptValues.O32_A120	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A120)
419.1	stat	OptValues.O32_A121	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A121)
419.2	stat	OptValues.O32_A122	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A122)
419.3	stat	OptValues.O32_A123	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A123)
419.4	stat	OptValues.O32_A124	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A124)
419.5	stat	OptValues.O32_A125	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A125)
419.6	stat	OptValues.O32_A126	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A126)
419.7	stat	OptValues.O32_A127	BOOL	FALSE	FALSE	opt.val 32 = RStt reserve status (Pr10 A127)
420.0	stat	OptValues.O33_FirmwareVersion	DWORD	DW#16#0	DW#16#0	opt.val 33 = FWVer firmware version
424.0	stat	OptValues.O34_MaxFeedrate	REAL	0.000000e+000	0.000000e+000	opt.val 34 = FY1max max feedrate
428.0	stat	OptValues.O35_MaxPrehopperLevel	REAL	0.000000e+000	0.000000e+000	opt.val 35 = L13max weighing range of prehopper
432.0	stat	OptValues.O36_MaxSiloLevel	REAL	0.000000e+000	0.000000e+000	opt.val 36 = max.level silo LAH4
436.0	stat	OptValues.O37_NomRatePrefeeder	REAL	0.000000e+000	0.000000e+000	opt.val 37 = nom. refill rate pfeeder ID32.11
440.0	stat	OptValues.O38_NomRateLevelfeeder	REAL	0.000000e+000	0.000000e+000	opt.val 38 = nom. refill rate levelfeeder ID34.11
444.0	stat	OptValues.O39_RelLoadinAtInfeed	REAL	0.000000e+000	0.000000e+000	opt.val 39 = WI2 relative loading at infeed point
448.0	stat	OptValues.O40_AverageRatePrefeeder	REAL	0.000000e+000	0.000000e+000	opt.val 40 = AVR average filling rate of pfeeder
452.0	stat	OptValues.O41	REAL	0.000000e+000	0.000000e+000	opt.val 41 = future use
456.0	stat	OptValues.O42	REAL	0.000000e+000	0.000000e+000	opt.val 42 = future use
460.0	stat	OptValues.O43	REAL	0.000000e+000	0.000000e+000	opt.val 43 = future use
464.0	stat	OptValues.O44	REAL	0.000000e+000	0.000000e+000	opt.val 44 = future use
468.0	stat	OptValues.O45	REAL	0.000000e+000	0.000000e+000	opt.val 45 = future use
472.0	stat	OptValues.O46	REAL	0.000000e+000	0.000000e+000	opt.val 46 = future use
476.0	stat	OptValues.O47	REAL	0.000000e+000	0.000000e+000	opt.val 47 = future use
480.0	stat	OptValues.O48	REAL	0.000000e+000	0.000000e+000	opt.val 48 = future use

## 4 INDEX HISTORY

Index	Author	Edition	Modifications
0	pk-de	2014-08-18	First issue.

Subject to change without notice.

The technical data and specifications are valid at the time of publication of this documentation. The information provided in this publication is, however, checked on a regular basis and any necessary corrections made in subsequent editions.

FLSmidth Pfister GmbH reserves the right to alter these versions at any time.

We are always grateful for suggestions for improvement.