Integration Manual T3

FieldBus

DWC-7A

Index

Revision list

Revision	Datum	Autor	Kapitel	Beschreibung
T3_FBUS7A_V1_0en	12.03.2015	Ratzinger		First Edition
	20.06.2015	Leibner		Basic Translation
T3_FBUS7A_V1_1en	15.09.2015	Ratzinger		General Revision / Einfügen neuer Befehle
T3_FBUS7A_V1_2en	25.07.2016	Krichbaum		General Revision / Insert new status
T3_FBUS7A_V1_26en	30.11.2016	Ratzinger		Corp. Design + Bus-Command4
T3_FBUS7A_V2_00en	14.11.2017	Ratzinger	All	Modifications DWC-7B, Screenshoots for DeviceNet, EthernetIP

Software indication

These instructions are based on following Software versions

W.00.02.00 (Base unit / Weighing system)
P.00.02.00 (Service modules)

In course of the technical progress changes can be carried out at the software. At subsequent software versions therefore, deviations are possible compared to these instructions.

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1 General description

This part of the Service instructions describes the details of communication possibilities by Fieldbus systems of the DWC-7A scale system. It is an extension of the T1-Service instructions but is no separate manual.
It has been moved into a separate part since the Fieldbus system is an option installed into the DWC-7A or DWC-7B system only on client's request.

1.1Symbols

This manual is using the following symbols as special indications:

IMPORTANT INDICATION!
Marks an important indication.

WARNING!
Marks a general warning.

DANGER!
Means that death or severe personal injury may occur if the corresponding precautions are not taken.

*   marks KUKLA-factory standard settings

PLC   Is an industrial digital computer or a programmable logic controller (PLC)

2PROFIBUS-DP
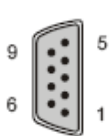
2.1 General

Scale computers of series DWC-7A can be equipped with a ProfiBus DP Interface. This Interface has to be indicated in the order. A subsequent installation on consultation with the manufacturer is possible, too. The interface is licenced by the manufacturer KUKLA and corresponds to the ProfiBus Norm 50170. Optionally beside many other communication solutions also a DP V1 or a ProfiNet-interface can be realised.

2.2 Data transfer rate / Connector assignment

The Interface supports the usual normed data transfer rates up to 12 MBit. In case of higher transfer rates absolutely plugs approved thereto have to be used..

Interface	Pinout		
	Pin	RS485	
	1	Reserved	
	2	Reserved	
	3	RxD/TxD-P	Data[1]
	4	CNTR-P	Transmit enable
	5	DGND	Electrically isolated supply
	6	CP	Electrically isolated supply
	7	Reserved	
	8	RxD/TxD-N	Data\[2]
	9	CNTR-N	Transmit enable\
9-pin female DSUB connector	CNTR ... Directional switch for external repeater		

It is recommendable to use normed ProfiBus DP plug connectors. The cable heads have to be terminated with terminating resistors.

2.3 Station Address

The station address is adjusted via parameter P7XXX directly at the Operator panel.
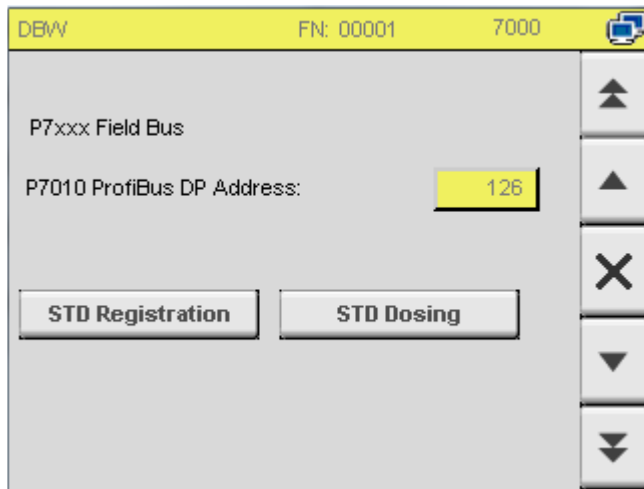
Relevant is parameter P7010. Addresses between 3 and 125 may be adjusted.

If Number 126 is adjusted all belonging Fieldbus – Parameters from Group P7xxx are disabled and not active.

! **AFTER CHANGING THE PROFIBUS-DP ADDRESS THE SCALE COMPUTER HAS TO BE TAKEN OFF VOLTAGE FOR ABOUT 5 SECONDS IN ORDER TO MAKE POSSIBLE TO TAKE OVER THE NEW ADDRESS.**

2.4 LED Status messages

Figure	LED	Color	Status	Description
	STATUS	Green	On	Interface module active
		Red	On	CPU starting up
	RxD	Yellow	On	The module receives data via the PROFIBUS DP slave interface
	TxD	Yellow	On	The module sends data via the PROFIBUS DP slave interface

2.5 Data structure / consistence

Please, find details concerning Data structure in the general part of section "General data structure".

The manufacturer describes in Chapter 9 a sample project for communication with Siemens S7 controllers. The IDE is Step7 Classic or TIA.

2.6 GSD- File

The required master data are supplied on CD or USB-Stick along with the scale computer or can be acquired directly from the manufacturer. Other file sizes than the ones described in this documentation are not possible.

For S7 Systems (300/400 and 1500 CPU´s) a library can be requested by KUKLA, which significantly simplifies the integration of a KUKLA-Controller. Basically, full communication is also – without the library described towards the end of the manual in details – possible.

3 PROFINET-IO

3.1 General

The scale computers of series DWC-7A can be equipped with an optional modular ProfiNet-IO-Interface. This Interface has to be indicated at the order. A subsequent installation on consultation with the manufacturer is possible, too. There must be a corresponding licence for the modules.
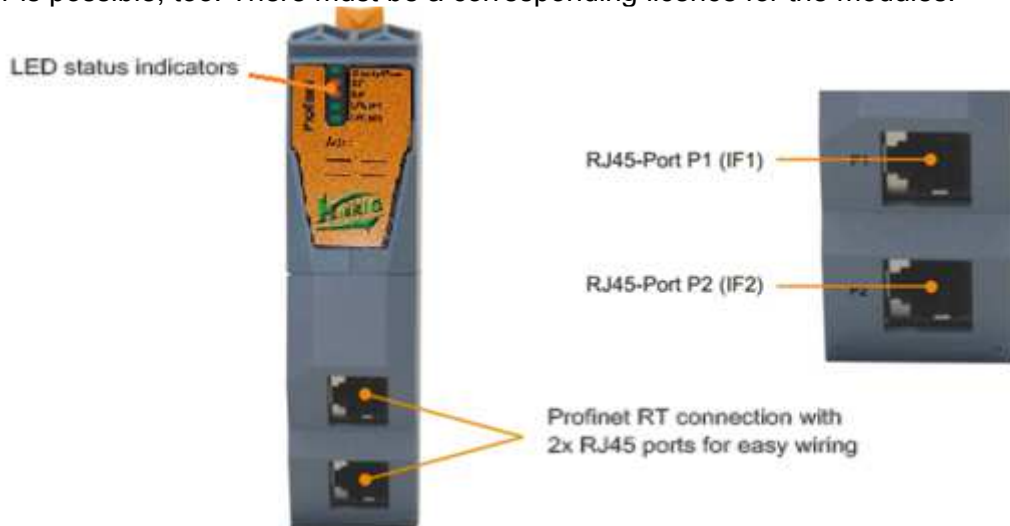
Das ProfiNet- Modul has integrated a 2 Port-Switch functionality.

3.2 Data transfer rate / Connector assignment

The ProfiNet-Module works as ProfiNet-IO-Device at the ProfiNet. It supports the Data telegram usual at KUKLA. The transfer is done via Twisted-Pair-cable in Full-Duplex-operation with 100 MBit/s. The IP-address adjustments as usual with ProfiNet are set at configuration of the ProfiNet-IO-Controller and later on at run-up of the IO Controller transferred to the module via the DCP-protocol. Alternatively address adjustments can be done via the device-sided Software-interface.

Interface	Pinout		
	Pin	Ethernet	
	1	RXD	Receive data
	2	RXD\	Receive data\
	3	TXD	Transmit data
Shielded RJ45 port	4	Termination	
	5	Termination	
	6	TXD\	Transmit data\
	7	Termination	
	8	Termination	

Following cabling regulations have to be observed:

• Use of CAT5 SFTP cable
• Keeping of bend radius of the cable (Observe cable data sheet)
• Fix the cable beneath the module.

The fixing must be located vertically below the RJ45 connector of the module.
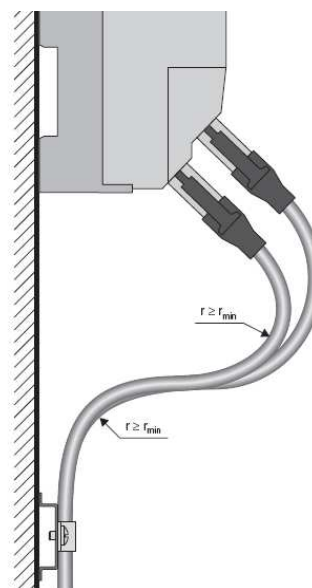
3.3 ProfiNet IP address

The station address – as usual with ProfiNet – is performed by the master program system by external „IP-config process ".

3.4 LED Status messages / Module structure

Figure	LED	Color	Status	Description
	READY/RUN	Green/red	Off	No power to module
		Red	Blinking	Boot error
			On	Communication on the PCI bus has not yet been started
		Green	On	PCI bus communication in progress
	SF	Red	Off	No error
			Cyc. Blinking[1]	DCP signal service triggered via bus
			On	System errors
	BF	Red	Off	No error
			Blinking	No data exchange
			On	No configuration or physical connection error
	L/A IF1/IF2	Green	Off	No link to remote station
			Flickering	A link to the remote station has been established. The LED blinks when Ethernet activity is taking place on the bus.
			On	A link to the remote station has been established.

3.5 Data structure / consistence

Please, find details concerning Data structure in the general part of section "General data structure".

The manufacturer describes in Chapter 9 a sample project for communication with Siemens S7 controllers. The IDE is Step7 Classic or TIA.

3.6 GSDML- File

The required GSD-XML-files are supplied on disk/CD along with the scale computer or can be acquired directly from the manufacturer. Other file sizes than the ones described in this documentation are not possible.

For S7 Systems (300/400 or 1500 CPU´s) a library can be requested by KUKLA, which significantly simplifies the integration of a KUKLA-Controller. Basically, full communication is also – without the library described towards the end of the manual in details – possible.

4 DeviceNet

4.1 General

The scale computers of series DWC-7A can be equipped with an optional modular DeviceNet (Slave) – Interface. This Interface has to be indicated at the order. A subsequent installation on consultation with the manufacturer is possible, too. There must be a corresponding licence for the modules.

At the interface module a terminating resistor is already integrated. By means of a switch at the case bottom the terminating resistor is switched on or off, an activated terminating resistor is indicated by the LED "TERM".
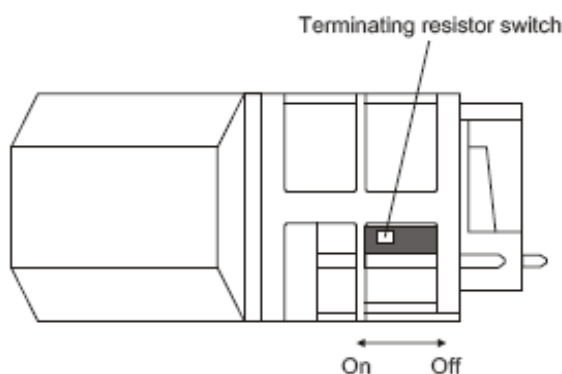
It is recommended to integrate the terminating resistor into the plug connector in order to ensure a clean bus termination after disconnecting the participant. The switch at the module thereto always has to be switched off!

4.2 Data transfer rate / Connector assignment

The interface module is equipped with a DeviceNet Slave (Adapter) interface. It supports the data telegram usual at KUKLA. The transfer is done via a specific and suitable DeviceNet-cable.

Interface		Pinout		
		Terminal	DeviceNet	
1		1	CAN⊥ (V-)	CAN ground
		2	CAN_L	CAN low
		3	SHLD	Shield
		4	CAN_H	CAN high
5		5	V+	Supply voltage[1]
5-pin male multipoint connector				

1) A 24 V Supply voltage can be connected to this connection. The voltage is only led through. The module neither provides it nor needs it.

4.3 Node Number (Stationaddress) / Baudrate

The station address is adjusted via parameter P7010 directly at the Operator panel. Parameter P7015 defines the communication speed on the CAN bus.

P7xxx Field Bus

P7010 Field Bus address: 126

P7015 Baud rate 0: 125 kBits/s

! AFTER CHANGING THE DEVICENET-ADDRESS THE SCALE COMPUTER HAS TO BE TAKEN OFF VOLTAGE FOR ABOUT 5 SECONDS IN ORDER TO MAKE POSSIBLE TO TAKE OVER THE NEW ADDRESS.

4.4 LED Status messages / Module structure

Figure	LED	Color	Status	Description
	READY/RUN	Green/red	Off	No power to module
		Green	On	PCI bus communication in progress
		Red	On	Communication on the PCI bus has not yet been started
	MOD/NET	Green/red	Off	Module supply not connected or module is not online
		Green	Blinking	Module is online but the I/O connection is not active
			On	Module is online and the I/O connection is active ("operating")
		Red	Blinking	The red LED blinks if at least one of the following errors has occurred: • Minor fault (recoverable fault) • Connection error • No DeviceNet supply voltage
			On	Critical fault or critical connection error (double MAC ID, bus failure or module defect)
	TxD	Yellow	Flickering or on	Module sending data via the DeviceNet interface
	TERM	Yellow	On	Terminating resistor integrated in the module switched on

4.5 Data structure / consistence

Please, find details concerning Data structure in the general part of section "General data structure "

The manufacturer describes in Chapter 9 a sample project for communication with AB controllers. The programming environment is the Logix Designer.

4.6 EDS- File

The required EDS-files are supplied on CD / USB-Stick along with the scale computer or can be acquired directly from the manufacturer. Other file sizes than the ones described in this documentation are not possible.

5 ETHERNET-IP

5.1 General

The scale computers of series DWC-7B can be equipped with an Ethernet-IP Interface. This Interface has to be indicated at the order. A subsequent installation on consultation with the manufacturer is possible, too. There must be a corresponding licence for the modules.
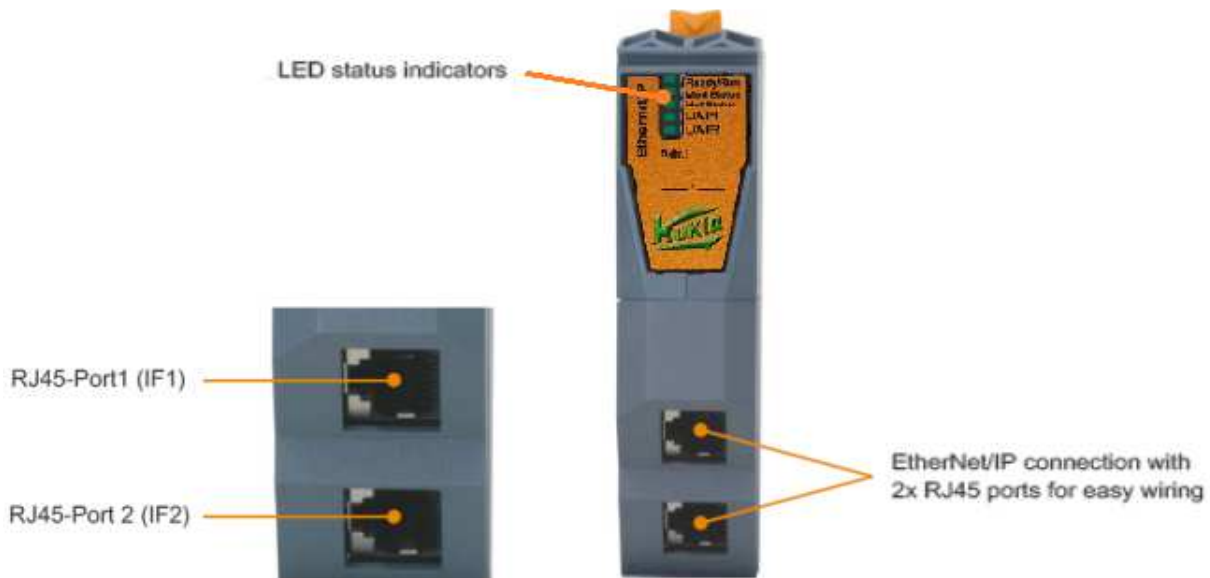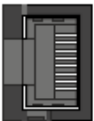
Das ProfiNet- Modul has integrated a 2 Port-Switch functionality.

5.2 Data transfer rate / Connector assignment

The interface module works as EtherNet/IP Adapter (Slave). The transfer is done via Ethernet-cable with /10100 MBit/s. The interface is designed with two RJ45-connectors. Both connections go to an integrated switch. By that Daisy-Chain-cablings at EtherNet/IP are easily possible.

• EtherNet/IP Adapter (Slave)
• Integrated switch for economic cabling

It supports the data telegram usual at KUKLA.

Interface	Pinout		
	Pin	Ethernet	
	1	RXD	Receive data
	2	RXD\	Receive data\
	3	TXD	Transmit data
	4	Termination	
	5	Termination	
Shielded RJ45 port	6	TXD\	Transmit data\
	7	Termination	
	8	Termination	

Following cabling regulations have to be observed:

• Use of CAT5 SFTP cable
• Keeping of bend radius of the cable (Observe cable data sheet)
• Fix the cable beneath the module

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The fixing has to be located in vertical direction beneath the RJ45 connector of the module.
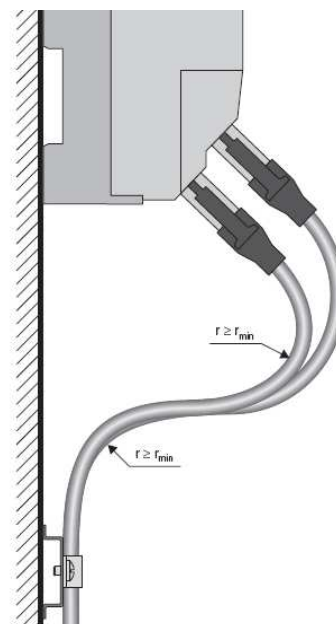
5.3 Station address / IP-Address

The IP-address adjustments are – as usual with EthernetIP – set at configuration of the IO-Controller.

P7xxx Field Bus				
P7020 IP config:	0: Static			
P7025 IP address:	0	0	0	0
P7026 Subnet Mask:	0	0	0	0

5.4 LED Statusmeldungen / Modulaufbau

Figure	LED	Color	Status	Description
	READY/RUN	Green/red	Off	No power to module
		Green	On	PCI bus communication in progress
		Red	Blinking	Boot error
			On	Communication on the PCI bus has not yet been started
	Mod status[1]	Green	Blinking	Interface module not yet configured
			On	Adapter (Slave) is operational
		Red	Blinking	Recoverable hardware error
			On	Irrecoverable hardware error
		Green/red	Blinking	Initialization / Self-test
			Off	No power to module
	Net status[1]	Green	Blinking	No active connection
			On	Indicates at least one active connection
		Red	Blinking	Timeout occurred on at least one connection
			On	An IP address has been used repeatedly
		Green/red	Blinking	Initialization / Self-test
			Off	No IP address assigned or module not supplied
	L/A IF1/IF2	Green	Off	No link to remote station
			Flickering	A link to the remote station has been established. The LED blinks when Ethernet activity is taking place on the bus.
			On	A link to the remote station has been established.

5.5 EDS- File (Electronic Data Sheet)

The necessary EDS files are delivered with the DWC-7B System on CD / USB stick or can be downloaded directly from manufacturer's website (www.kukla.co.at). Other data formats than those described are not possible.

The EDS file must first be integrated into the programming interface of the master controller (PLC).
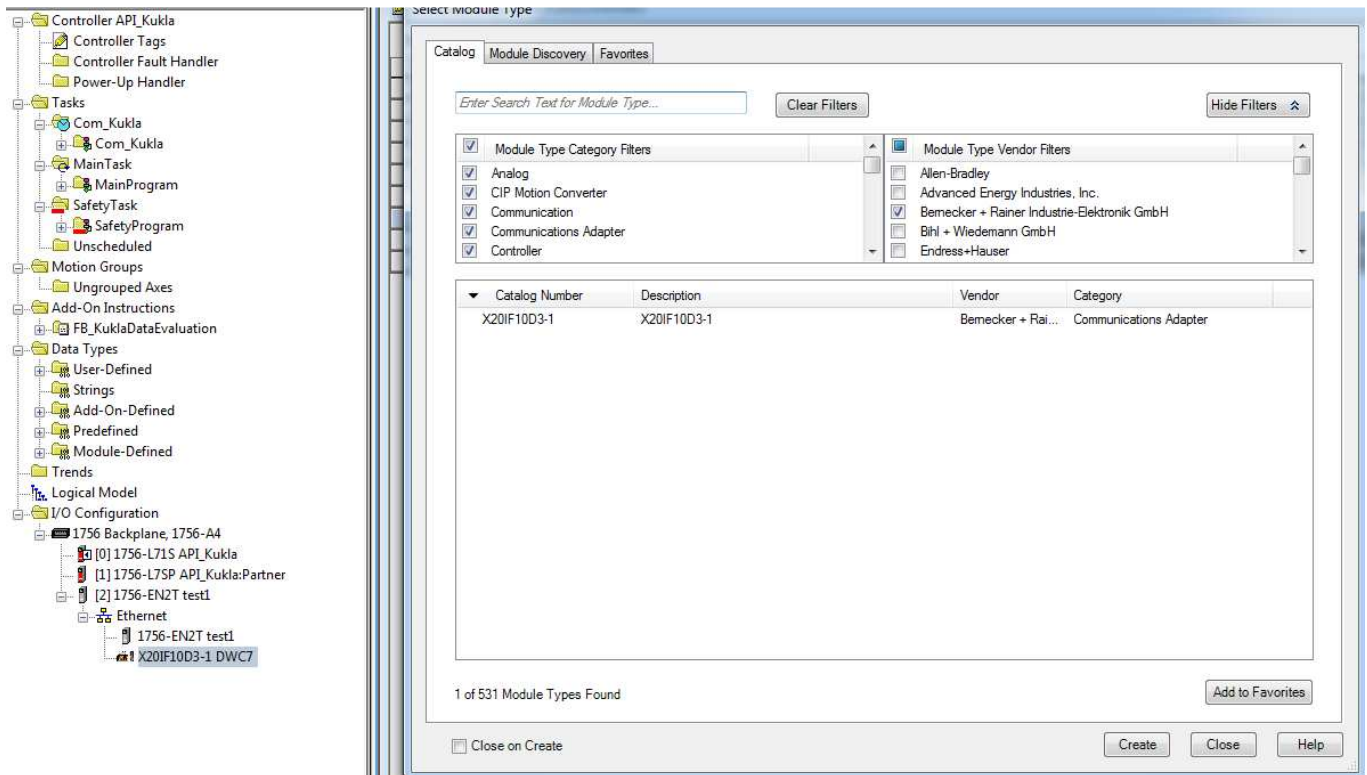
Next step is the definition of the module:
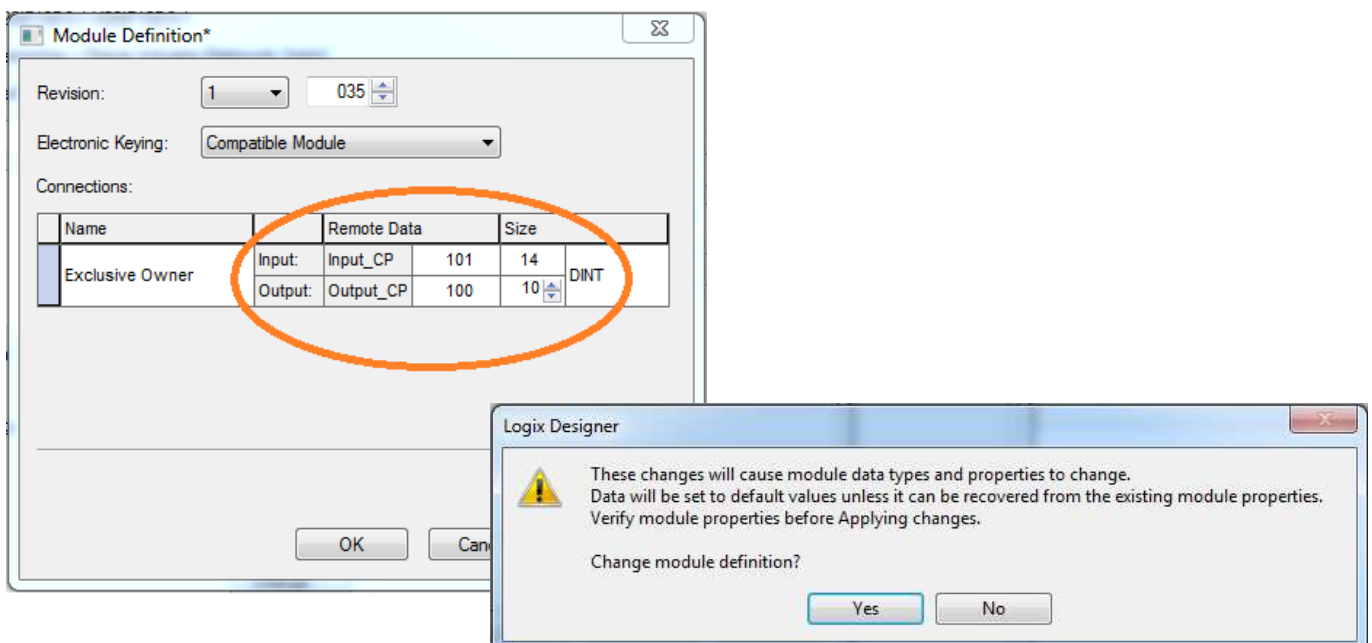
Now the setup of Name and IP according to the setup of P702x in the DWC-7B.
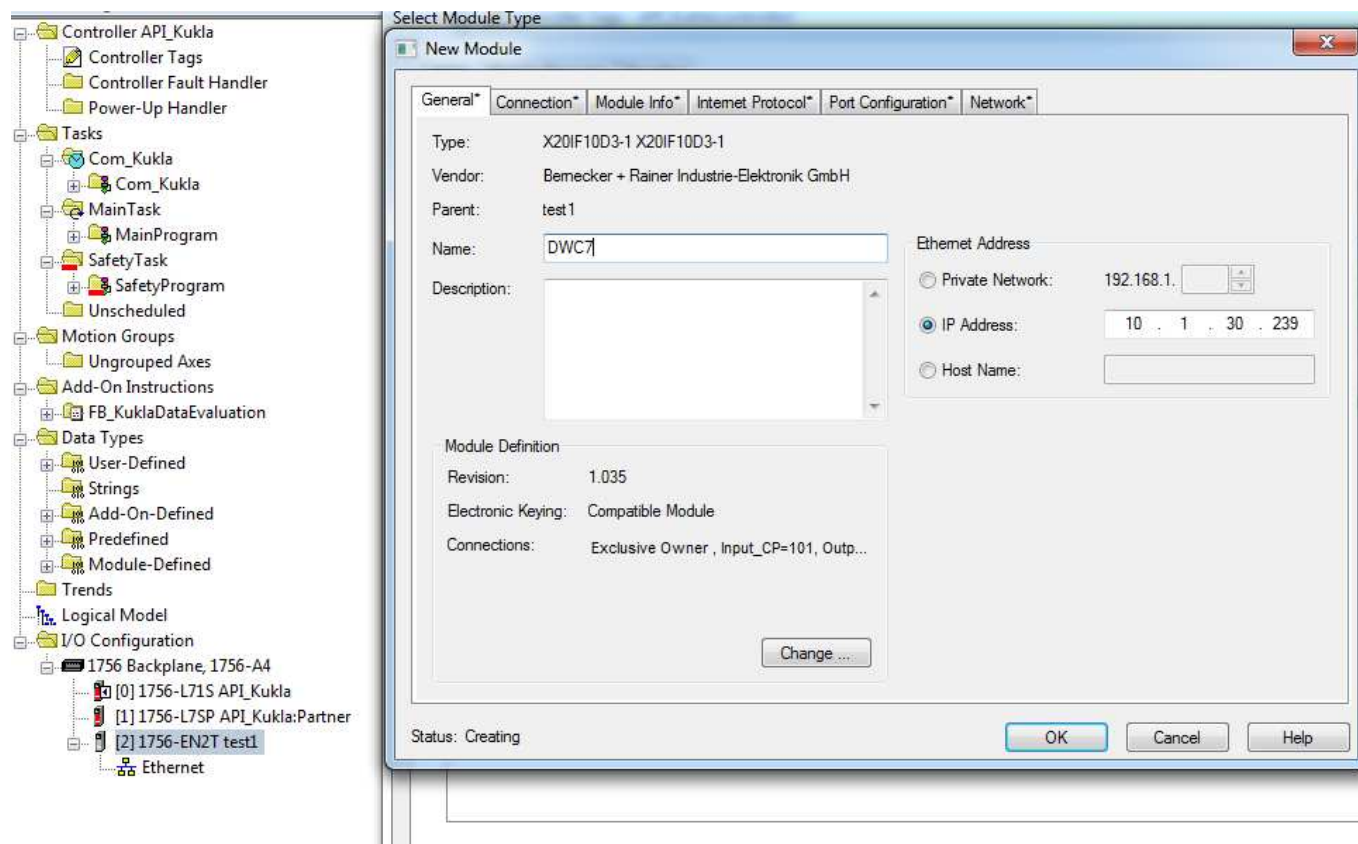
Thus, the module should be accessible after a download in the PLC.

5.6 Data structure / consistence

Please, find details concerning Data structure in the general part of section "General data structure".

The manufacturer describes later a sample project for communication with AB controllers. The programming environment is the Logix Designer.

6 General data structure

Generally always 10 Double words have to be transferred as nominal data by the superior control.

As usually the scale computer is able to collect a variety of data, always 14 Double words are signalled back to the superior system. To each process data double word via the corresponding parameter number individually can be allocated, which value exactly on this field is sent.

6.1 Set point - and process data fields

	PLC > DWC	DWC > PLC
00 Double word	BusIn DW00 (P7200)	BusOut DW00 (P7400)
01 Double word	BusIn DW01 (P7201)	BusOut DW01 (P7401)
02 Double word	BusIn DW02 (P7202)	BusOut DW02 (P7402)
03 Double word	BusIn DW03 (P7203)	BusOut DW03 (P7403)
04 Double word	BusIn DW04 (P7204)	BusOut DW04 (P7404)
05 Double word	BusIn DW05 (P7205)	BusOut DW05 (P7405)
06 Double word	BusIn DW06 (P7206)	BusOut DW06 (P7406)
07 Double word	BusIn DW07 (P7207)	BusOut DW07 (P7407)
08 Double word	BusIn DW08 (P7208)	BusOut DW08 (P7408)
09 Double word	BusIn DW09 (P7209)	BusOut DW09 (P7409)
10 Double word		BusOut DW10 (P7410)
11 Double word		BusOut DW11 (P7411)
12 Double word		BusOut DW12 (P7412)
13 Double word		BusOut DW13 (P7413)

Absolute values are transferred as 1/10 kg numbers or in kg (see detail indications).
Per cent values are transferred as values with 1/100 per cent resolution (e.g. 74.83 % corresponds to number value 7483).

6.2 Data structure recommended by KUKLA:

(Details see following chapter)

00 Double word	12: Bus ABS 1 [kg/h] *	50: P3 Capacity [kg/h] *
01 Double word	21: Bus Command 1 *	44: Counter A [kg] *
02 Double word	22: Bus Command 2 *	45: Counter B [kg] *
03 Double word	00: ---	32: BusControlBits *1
04 Double word	04: Bus percent 1 *	33: BusControlBits 2 *
05 Double word	05: Bus percent 2 *	35: BusStatusBits 1 *
06 Double word	00: ---	36: BusStatusBits 2 *
07 Double word	00: ---	02: Drive WB [%] *
08 Double word	23: Bus Command 3	01: Feeder setpoint [%] *
09 Double word	24: Bus Command 4	08: g3-load [%] *
10 Double word		22: Speed [%] *
11 Double word		03: 0% output [%] / Spare *
12 Double word		03: 0% output [%] / Spare *
13 Double word		03: 0% output [%] / Spare *

6.3 Details Bus Setpoints (Process In)

BusSet - Doublewords		
Denomination	Description	Format
00: ---	Data FIELD is unused	
01: ---	reserved	
02: ---	reserved	
03: ---	reserved	
04: Bus percent 1	Bus Setpoint percent 1	%-Value
05: Bus percent 2	Bus Setpoint percent 2	%-Value
06: Bus percent 3	Bus Setpoint percent 3	%-Value
07: Bus percent 4	Bus Setpoint percent 4	%-Value
08: Bus ABS 1	BusAbsolute value - buffer 1	Absolut
09: Bus ABS 2	BusAbsolute value - buffer 2	Absolut
10: Bus ABS 3	BusAbsolute value - buffer 3	Absolut
11: Bus ABS 4	BusAbsolute value - buffer 4	Absolut
12: Bus ABS 1 [kg/h]	Bus Kilo Setpoint 1 (e.g. Capacity Setpoint)	kg
13: Bus ABS 2 [kg/h]	Bus Kilo Setpoint 2	kg
14: Bus ABS 3 [kg/h]	Bus Kilo Setpoint 3	kg

15: Bus ABS 4 [kg/h]	Bus Kilo Setpoint 4	kg
16: Bus ABS 1 [1/10 kg/h]	Bus Dekagramm -Setpoint 1	1/10 kg
17: Bus ABS 2 [1/10 kg/h]	Bus Dekagramm -Setpoint 2	1/10 kg
18: Bus ABS 3 [1/10 kg/h]	Bus Dekagramm -Setpoint 3	1/10 kg
19: Bus ABS 4 [1/10 kg/h]	Bus Dekagramm -Setpoint 4	1/10 kg
20: ---	reserved	
21: Bus Command 1	BusCommand-Double word 1 (see following Bit-list)	Bitfield[32]
22: Bus Command 2	BusCommand-Double word 2 (see following Bit-list)	Bitfield[32]
23: Bus Command 3	BusCommand-Double word 3 (see following Bit-list)	Bitfield[32]
24: ---	reserved	
25: Parameter Number	Special function on consultation with manufacturer	
26: Parameter Value	Special function on consultation with manufacturer	
27: ---	reserved	
28: ---	reserved	
29: ---	reserved	
30: DWC3/5 CMD	Compatiblity for old DWC3/5 Systems Commands	
31: DWC3/5 SW1_2	Compatiblity for old DWC3/5 Systems Systemen SW	
32: DWC3/5 SW3_4	Compatiblity for old DWC3/5 Systems SW	
33: DWC3/5 SL1	Compatiblity for old DWC3/5 Systems SL	
34: DWC3/5 SL2	Compatiblity for old DWC3/5 Systems SL	

		Digital control commands to the scale computer
Bus Command 1	0x00000001	00: -
	0x00000002	01: QUANTITY COUNTER B PRINT / CLEAR
	0x00000004	02: QUANTITY COUNTER C PRINT / CLEAR
	0x00000008	03: REMOTE START (static contact)
	0x00000010	04: CONVEYOR SYSTEM RUNS
	0x00000020	05: REMOTE-MODE
	0x00000040	06: PANEL-MODE
	0x00000080	07: MIS RUN
	0x00000100	08: SYNC-PULSE (Absolute value tare)
	0x00000200	09: DRIVE FAULT
	0x00000400	10: DELETE ERROR
	0x00000800	11: PANEL START (rising edge)-
	0x00001000	12: FIELD INPUT 1 (switches FIELD RELAY 1)
	0x00002000	13: FIELD INPUT 2 (switches FIELD RELAY 2)
	0x00004000	14: FIELD INPUT 3 (switches FIELD RELAY 3)
	0x00008000	15: FIELD INPUT 4 (switches FIELD RELAY 4)
	0x00010000	16: FIELD INPUT 5 (switches FIELD RELAY 5)
	0x00020000	17: FIELD INPUT 6 (switches FIELD RELAY 6)
	0x00040000	18: FIELD INPUT 7 (switches FIELD RELAY 7)
	0x00080000	19: LIVE BIT
	0x00100000	20: TENSION CLEANING CHAIN
	0x00200000	21: >0< START
	0x00400000	22: START TEST (Testweight)
	0x00800000	23: START MATERIALTEST
	0x01000000	24: SUSPEND MEASURING
	0x02000000	25: ENABLE REGULATOR (Feeder operation)
	0x04000000	26: FEEDER REDUCTION (Feeder operation)
	0x08000000	27: JOG Feeder
	0x10000000	28: -
	0x20000000	29: REFILLING INDICATOR (Loss-in-weight-dosing)
	0x40000000	30: START BATCH (Batch mode)
	0x80000000	31: INTERRUPT BATCH (Batch mode)
Bus Command 2	0x00000001	32: EMPTYING SYSTEM (Batch mode)
	0x00000002	33: FINE STREAM (Batch mode)
	0x00000004	34: BATCH REMOT SETPOINT (Batch mode)--
	0x00000008	35: FEEDINGCHANNEL x1 (Batch mode)
	0x00000010	36: FEEDINGCHANNEL x2 (Batch mode)
	0x00000020	37 --
	0x00000040	38: COUNTING TO G2
	0x00000080	39: CALCULATE DRY WEIGHT
	0x00000100	40: ADAPT SPAN (Check weigher)
	0x00000200	41: –
	0x00000400	42: BELT MISRUN LEFT–
	0x00000800	43: BELT MISRUN RIGHT
	0x00001000	44: BELT EDGE SENSOR ON (Belt steering device)
	0x00002000	45: BELT EDGE SENSOR OFF (Belt steering device)
	0x00004000	46: STEERING DEV EXTENDED (Belt steering device)
	0x00008000	47: STEERING DEV RETRACTED (Belt steering device)
	0x00010000	48: –
	0x00020000	49: SLIPDETECTION –
	0x00040000	50: TACHO INPUT (not usable for Bus / too fast pulses)
	0x00080000	51: EMERGENCY DEVICE (indication only)
	0x00100000	52: VOLUMETRIC Mode
	0x00200000	53:-
	0x00400000	54: DRIVE LOCK
	0x00800000	55: LOCAL-Mode
	0x01000000	56: LOCAL START (edge controlled)
	0x02000000	57: LOCAL STOP (edge controlled)
	0x04000000	58: CENTRAL OPERATION
	0x08000000	59: -
	0x10000000	60: JOG MAIN DRIVE

	0x20000000	61: -
	0x40000000	62: -
	0x80000000	63: -
Bus Command 3	0x00000001	64: CHANNEL 1 START (support drives)
	0x00000002	65: CHANNEL 1 STOP (support drives)
	0x00000004	66: -
	0x00000008	67: -
	0x00000010	68: CHANNEL 2 START (support drives)
	0x00000020	69: CHANNEL 2 STOP (support drives)
	0x00000040	70: -
	0x00000080	71: -
	0x00000100	72: CHANNEL 3 START (support drives)
	0x00000200	73: CHANNEL 3 STOP (support drives)
	0x00000400	74: -
	0x00000800	75: -
	0x00001000	76: CHANNEL 4 START (support drives)
	0x00002000	77: CHANNEL 4 STOP (support drives)
	0x00004000	78: -
	0x00008000	79: -
	0x00010000	80: CHANNEL 5 START (support drives)
	0x00020000	81: CHANNEL 5 STOP (support drives)
	0x00040000	82: -
	0x00080000	83: -
	-	reserved
Bus Command 4	0x00000001	96: XD1 pulse (speed monitor sensor auxiliary drive 1)
	0x00000002	97: XD1 run (run indication from auxiliary drive 1)
	0x00000004	98: XD1 fault (external fault at auxiliary drive 1)
	0x00000008	99: -
	0x00000010	100: -
	0x00000020	101: XD2 pulse (speed monitor sensor auxiliary drive 2)
	0x00000040	102: XD2 run (run indication from auxiliary drive 2)
	0x00000080	103: XD2 fault (external fault at auxiliary drive 2)
	0x00000100	104: -
	0x00000200	105: -
	0x00000400	106: XD3 pulse (speed monitor sensor auxiliary drive 3)
	0x00000800	107: XD3 run (run indication from auxiliary drive 3)
	0x00001000	108: XD3 fault (external fault at auxiliary drive 3)
	0x00002000	109: -
	0x00004000	110: -
	0x00008000	111: XD4 pulse (speed monitor sensor auxiliary drive 4)
	0x00010000	112: XD4 run (run indication from auxiliary drive 4)
	0x00020000	113: XD4 fault (external fault at auxiliary drive 4)
	0x00040000	114: -
	0x00080000	115: -
	0x00100000	116: XD5 pulse (speed monitor sensor auxiliary drive 5)
	0x00200000	117: XD5 run (run indication from auxiliary drive 5)
	0x00400000	118: XD5 fault (external fault at auxiliary drive 5)
	0x00800000	119: -
	0x01000000	120: -
	-	reserved
Please, find details concerning the BusCommands in the Parameter description of the Digital inputs (P60xx). The physical inputs as well as the BusCommands are connected in parallel.		

6.4 Description of Bus actual values (Process data out)

ProcessData / BusOut- Double words		
Denomination	Description	Format
00: P3 Capacity [%]	Current actual capacity at discharge point	%-Value
01: Feeder setpoint [%]	Variable for Feeder drive	%-Value
02: Drive WB [%]	Variable for dosing Drive (weighing belt,dosing screw etc.)	%-Value
03: 0% output [%]	Zero value Output (primarily for adjustment works)	%-Value
04: 50% output [%]	50% - value Output (primarily for adjustment works)	%-Value
05: 100% output [%]	100% - value Output (primarily for adjustment works)	%-Value
06: g1-load [%]	Current load on measuring length Output	%-Value
07: g2-load [%]	Current load at dosing point g2 Output	%-Value
08: g3-load [%]	Current load am dosing point Output	%-Value
09: Scaling 2 [%]	Scaling factor 2 for internal data scalings	%-Value
10: Setpoint output [%]	Feedback of current Set point	%-Value
11: P2 Capacity [%]	Current dosing capacity at dosing point in per cent	%-Value
12: P1 Capacity [%]	Current Capacity on measuring length in per cent	%-Value
13: Deviation [%]	Deviation between nominal and actual dosing capacity	%-Value
14: Batch Finestream [%]	Batch control: variable for analog Fine stream	%-Value
15: Feeder Deviation [%]	Current Feeder deviation	%-Value
16: Distance-FIFO	Special functions: Path delay fifo	%-Value
17: Transfervalue 1	Special functions: Transfer value 1 for Data transfer	%-Value
18:Transfervalue 2	Special functions: Transfer value 2 for Data transfer	%-Value
19: Gross-Load [%]	Subtraction system: Gross weight for downstream scale	%-Value
20: Bin Load [%]	Currently Bin weight in %	%-Value
21: PreBin-Regulator [%]	Variable for Pre-bin regulator	%-Value
22: Speed [%]	Current Belt speed in per cent	%-Value

24: TW [%]	Currently used test weight in %	%-Value
25: g1RR-Load [%]	Side weight evaluation: Load rightmost	%-Value
26: g1R-Load [%]	Side weight evaluation: Load right	%-Value
27: g1L-Load [%]	Side weight evaluation: Load left	%-Value
28: g1LL-Load [%]	Side weight evaluation: Load leftmost	%-Value
29: g1 total [g]	Absolute weight at g1 section in g	Gramm
30: g3 total [g]	Absolute weight at g3 section in g	Gramm

32: BusControlBits 1	Bus Controlbits-Doubleword 1 (see following List)	Bitfield[32]
33: BusControlBits 2	Bus Controlbits-Doubleword 2 (see following List)	Bitfield[32]
34: BusControlBits 3	Bus Controlbits-Doubleword 3 (see following List)	Bitfield[32]

35: BusStatusBits1	Error / Status-Doubleword 1 (see following List)	Bitfield[32]
36: BusStatusBits2	Error / Status-Doubleword 2 (see following List)	Bitfield[32]

41: Counter A [Countingunit]	EndlessCounter A in parameterized Counter unit	
42: Counter B [Countingunit]	ShiftCounter B in parameterized Counter unit	
43: Counter C [Countingunit]	ShiftCounter C in parameterized Counter unit	
44: Counter A [kg]	non-resettable Endless counter A in kg	kg
45: Counter B [kg]	ShiftCounter B in kg	kg
46: Counter C [kg]	ShiftCounter C in kg	kg
47: Counter A [1/10 kg]	non-resettable EndlessCounter A in 100g resolution	1/10 kg
48: Counter B [1/10 kg]	ShiftCounter B in in 100g resolution	1/10 kg
49: Counter C [1/10 kg]	ShiftCounter C in in 100g resolution	1/10 kg
50: P3 Capacity [kg/h]	Current Conveying capacity at discharge point P3 in kg/h	kg
51: P3 Capacity [1/10 kg/h]	Curr. Conveying capacity at discharge point P3 in 1/10 kg/h	1/10 kg
---		
53: WC 1 [%]	Current value at weighing channel 1	%
54: WC 2 [%]	Current value at weighing channel 2	**%**
55: WC 3 [%]	Current value at weighing channel 3	**%**
56: WC 4 [%]	Current value at weighing channel 4	**%**
57: WC5 [%]	Current value at weighing channel 5	**%**
58: Target occupancy [%]	Load Setpoint	%
59: PreBin Zone1 [g]	PreBin weight in Area 1	g
60: PreBin Zone2 [g]	PreBin weight in Area 2	g
61: PreBin Zone3 [g]	PreBin weight in Area 3	g
62: PreBin Zone4 [g]	PreBin weight in Area 4	g
63: PreBin Sum [%]	PreBin Total weight in percent	%-Value
64: PreBin Absolut [g]---	PreBin Total weight absolute in percent	g
65: Parameter- Number	Special function on consultation with manufacturer	
66: Parameter- Value	Special function on consultation with manufacturer	

68: g1Rright [abs]	Total weight Belt section right hand side	
69: g1Left [abs]	Total weight Belt section left hand side	

74: AW[%]		
75: DWC 3/5 Statusword	Compatibility to former DWC3/5 Statusword	
76: DWC3/5 Relaisword	Compatibility to former DWC3/5 Relaisword	
77: DWC3/5 IW1_2	Compatibility to former DWC3/5 Inputwords	

78: DWC3/5 IW 3_4	Compatibility to former DWC3/5 Inputwords	
79: DWC3/5 IL1	Compatibility to former DWC3/5 Input double word	
80: DWC3/5 IL2	Compatibility to former DWC3/5 Input double word	

		Digital control commands from scale computer
Bus ControlBits 1	0x00000001	00:--
	0x00000002	01: WARNING (Sum signal)
	0x00000004	02: READY TO OPERATE
	0x00000008	03: CONVEYING SYSTEM STOPPED (inversely usable as Belt runs)
	0x00000010	04: EMPTY-MESSAGE
	0x00000020	05: G3 MIN-LOAD
	0x00000040	06: G3 MAX LOAD
	0x00000080	07: PANEL Mode active--
	0x00000100	08 REMOTE- Mode active
	0x00000200	09: DEVIATION
	0x00000400	10: SLIP
	0x00000800	11: TEST / TARE RUNS
	0x00001000	12: LAY ON TEST WEIGHT
	0x00002000	13: MAIN DRIVE ON
	0x00004000	14: FEEDER ON
	0x00008000	15: FEEDER REDUCTION
	0x00010000	16: FEEDER DIRECTION (dosing drum control)
	0x00020000	17: FEEDER OPEN (dosing drum control)
	0x00040000	18: FEEDER CLOSED (dosing drum control)
	0x00080000	19: -
	0x00100000	20: MOTOR SCALE (Batch mode)
	0x00200000	21: BATCH ENABLE (Batch mode)
	0x00400000	22: COARSE STREAM (Batch mode)
	0x00800000	23: FINE STREAM (Batch mode)
	0x01000000	24: -
	0x02000000	25: FILLING WEIGHING BIN (Loss-in-weight dosing)
	0x04000000	26: BIN EMPTY (Loss-in-weight dosing)
	0x08000000	27: MOVEMENT ERROR (Loss-in-weight dosing)
	0x10000000	28: DEVIATION DETECTED (Check weigher)
	0x20000000	29: -
	0x40000000	30: COUNTER SIGNAL (not usable via Bus !)
	0x80000000	31: LIVE BIT (inverted to Input signal)
		Digital control commands from the scale computer
Bus ControlBits 2	0x00000001	32: FIELDRELAY 1 (reads FIELD OPTO 1)
	0x00000002	33: FIELDRELAY 2 (reads FIELD OPTO 2)
	0x00000004	34: FIELDRELAY 3 (reads FIELD OPTO 3)
	0x00000008	35: FIELDRELAY 4 (reads FIELD OPTO 4)
	0x00000010	36: FIELDRELAY 5 (reads FIELD OPTO 5)
	0x00000020	37: FIELDRELAY 6 (reads FIELD OPTO 6)
	0x00000040	38: FIELDRELAY 7 (reads FIELD OPTO 7)
	0x00000080	39: -
	0x00000100	40: -
	0x00000200	41: STEERING-COMMAND (2 point regulator)
	0x00000400	42: -
	0x00000800	43: BELT MISRUN
	0x00001000	44: -
	0x00002000	45: LOCAL ACTIVE
	0x00004000	46: -
	0x00008000	47: -
	0x00010000	48: -
	0x00020000	49: BELTSTEERING PULL
	0x00040000	50: BELTSTEERING PUSH
	0x00080000	51: AUXILIARY DRIVE 1 ON
	0x00100000	52: AUXILIARY DRIVE 2 ON
	0x00200000	53: AUXILIARY DRIVE 3 ON
	0x00400000	54: AUXILIARY DRIVE 4 ON
	0x00800000	55: AUXILIARY DRIVE 5 ON
	0x01000000	56:
	0x02000000	57:

	0x04000000	58:
	0x08000000	59:
	0x10000000	60: Behälter max
	0x20000000	61: Behälter min
	0x40000000	62: SF Waagenantrieb EIN
	0x80000000	63: SF
	Digital control commands from the scale computer	
Bus CommandBits 3	0x00000001 to 0x80000000	reserved
See details about function of control bits under digital Outputs (P64xx). BusCommandbits are similar to physical digital Outputs (DO).		

	Digital status information's from the scale computer	
Bus StatusBits 1	0x00000001	S00: WC 0 fault LOAD CELL mV FAULT CHANNEL 1 (Standard)
	0x00000002	S01: WC 1 fault LOAD CELL mV FAULT CHANNEL 2
	0x00000004	S02: WC 2 fault LOAD CELL mV FAULT CHANNEL 3
	0x00000008	S03: WC 3 fault LOAD CELL mV FAULT CHANNEL 4
	0x00000010	S04: WC 4 fault LOAD CELL mV FAULT CHANNEL 5
	0x00000020	S05: WC 5 fault LOAD CELL mV FAULT CHANNEL 6
	0x00000040	S06: -
	0x00000080	S07: -
	0x00000100	S08: BELT EMPTY
	0x00000200	S09: DISCHARGE END WEIGHT LESS THAN MIN
	0x00000400	S10: DISCHARGE END WEIGHT GREATER THAN MAX
	0x00000800	S11: -
	0x00001000	S12: DRIVE/ TACHO FAULT
	0x00002000	S13: SYNC ERROR (Belt Startmarker)
	0x00004000	S14: FEEDER ERROR
	0x00008000	S15: BELT MIS RUN
	0x00010000	S16: SLIP
	0x00020000	S17: DRIVE STOPPED
	0x00040000	S18: Set point ERROR
	0x00080000	S19: DEVIATION –
	0x00100000	S20: -
	0x00200000	S21: BELT MIS RUN LEFT
	0x00400000	S22: BELT MIS RUN RIGHT
	0x00800000	S23: TENSION CLEANING CHAIN (autom. cleaning device)
	0x01000000	S24: TARE ERROR
	0x02000000	S25: TEST ERROR
	0x04000000	S26: FILLING REQUIREMENT (Loss-in-weight-dosing)
	0x08000000	S27: MOVEMENT ERROR (Loss-in-weight-dosing)
	0x10000000	S28: DECENTRALE IO OFFLINE
	0x20000000	S29: -
	0x40000000	S30: EMERGENCY AKTIV
	0x80000000	S31: FELDBUS OFFLINE (Kommunikation zur übergeordneten Steuerung)
	Digital status information's from the scale computer	
Bus StatusBits 2	0x00000001	S32: MM00 Error
	0x00000002	S33: MM00 Inverter failure
	0x00000004	S34: MM00 Offline
	0x00000008	S35: -
	0x00000010	S36: MM01 Error
	0x00000020	S37: MM01 Inverter failure
	0x00000040	S38: MM01 Offline
	0x00000080	S39: -
	0x00000100	S40: MM10 Error
	0x00000200	S41: MM10 Inverter failure
	0x00000400	S42: MM10 Offline
	0x00000800	S43: -

0x00001000	S44: MM11 Error	
0x00002000	S45: MM11 Inverter failure	
0x00004000	S46: MM11 Offline	
0x00008000	S47: -	
0x00010000	S48: XD1 speed monitoring	
0x00020000	S49: XD1 fault	
0x00040000	S50: -	
0x00080000	S51: XD2 speed monitoring	
0x00100000-	S52: XD2 fault	
0x00200000	S53: -	
0x00400000	S54: XD3 speed monitoring	
0x00800000	S55: XD3 fault	
0x01000000	S56: -	
0x02000000	S57: XD4 speed monitoring	
0x04000000	S58: XD4 fault	
0x08000000	S59: -	
0x10000000	S60: XD5 speed monitoring	
0x20000000	S61: XD5 fault	
0x40000000	S62: -	
0x80000000	S63: -- -	

See details about function of status bits under error messages Outputs (P22xx andP23xx). Bus Statusbits are similar to status display messages.

6.5 Command and Statusbits (Byte order / Endianness)

Byte order (byte order or endianness) defines the memory organization for INT and DINT variables. This is especially important in the detection of control bits!

Bit fields (status and command double words) are usually transmitted as double words by the DWC-7 base unit. For AB controllers, the first bit (00 xxxxx) is usually located at the lowest byte address (0.0-0.7,1.0-1.7, 2.0-2.7,3.0-3.7). For Siemens S7 controllers, the first bit starts at the most significant address (3.0-3.7,2.0-2.7, 1.0-1.7,0.0-0.7)

6.6 Transfer of additional Data's via Mailbox (PA-Code und PA-Wert)

If additional process data or parameters in the DWC-7 base unit are to be read or written via fieldbus, this is possible to do this with the integrated mailbox system.

6.6.1 Activation of the Mailbox- Systems

The manufacturer recommends the following parameterization in order to activate the PLC send mailbox and the PLC receive mailbox at all.

Command channel PLC > DWC-7	Response channel DWC-7 > PLC
P7206_BusSet_DW24 = 25 Mailbox Number P7207_BusSet_DW28 = 26 Mailbox Value	P7412_BusAct_DW48 = 65 Mailbox Number P7413_BusAct_DW52 = 66 Mailbox Value

6.6.2 Expiry of a request

Basically, the higher-level system must always first describe the command channel. The following command codes are possible:

Mailbox Number Programming	Mailbox Number Request	Parametername	Unit
Group Statusvalues			
	1-899	Process datas	1/10 kg
Gruppe Command- Codes for Scale			
10900-10999	900-999	Command-Codes to DWC-7	

Group Scaleparameter- Settings			
11000-11999	1000-1999	Parameter group P1xxx Waagendaten	See T2 Parameter Manual
12000-12999	2000-2999	Parameter group P2xxx Limit / Warning	See T2 Parameter Manual
13000-13999	3000-3999	Parameter group P3xxx Dosing	See T2 Parameter Manual
14000-14999	4000-4999	Parameter group P4xxx Sonder Funktionen	See T2 Parameter Manual
15000-15999	5000-5999	Parameter group P5xxx Analog I/O	See T2 Parameter Manual
16000-16999	6000-6999	Parameter group P6xxx Digital I/O	See T2 Parameter Manual
17000-17999	7000-7999	Parameter group P7xxx Fieldbus	See T2 Parameter Manual
18000-18999	8000-8999	Reserved	
19000-19999	9000-9999	Not usable because these are OP-7 parameters which are internal in the operator panel.	

The group "Status values" allows an acyclic request of process data which is not part of the standard protocol. The associated mailbox value in irrelevant for this group.

The group "Command codes for Scale" allows specific program functions, such as the saving of data in the base unit. For some command codes, the associated mailbox value of the command channel is also relevant.

The group "Scale parameter settings" allows a query of a specific parameter number. All you have to do is send the parameter number in the mailbox number of the command channel. In the next telegram, the parameter number under Mailbox number is returned at the response channel and the current setting value of this parameter under Mailbox value.

In this way, the higher-level system can query all current settings using a query-and-response procedure.

If the value 10000 is added to the parameter number in the command channel instead, a new value can be sent to the base unit in the mailbox value. In this case, the base unit usually responds with the new value if it could be accepted or the old value if the change has denied.

! **For the first time, new parameter values are only stored in the RAM of the base unit, which is not protected against power failure.**
A permanent storage in the FLASH memory must be initiated via a separate command after the end of the last change.

In general, new parameter values must NOT be sent if the parameterization mode is activated on an operator panel. The corresponding status bit should be permanently checked before the send command.
For "Legal for Trade" verified systems, this option is generally prohibited and thus blocked.

7 Testscreen for Fieldbus-Interface
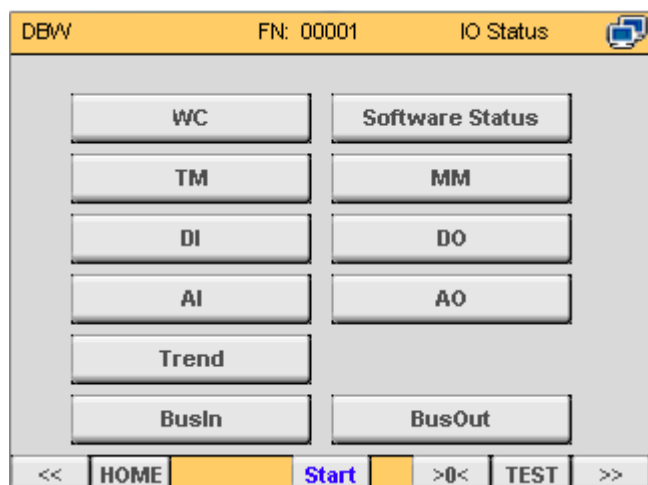
It is possible to control the data transfer of the Fieldbus interface. Thereto the arrow keys bottom left or right have to be pressed so often until this selection appears.
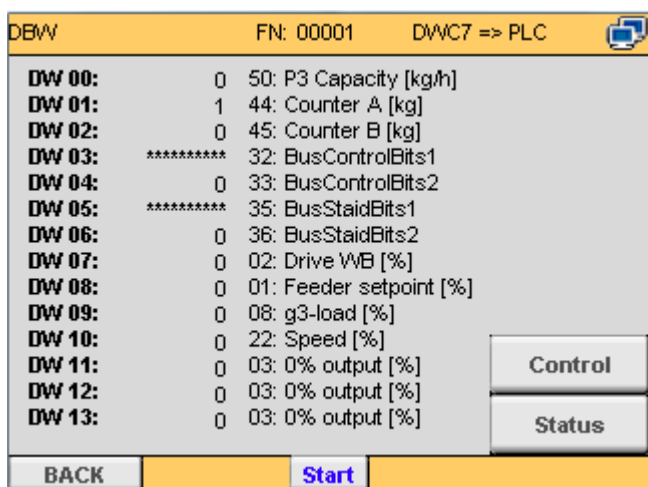
BusIn indicates the DWC-7 Set points

BusOut indicates the DWC-7 actual values
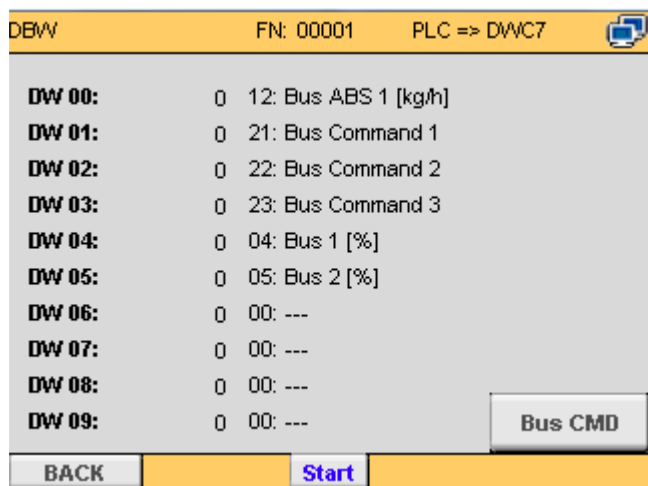
BusIn / DWC-7 Set points

The input values transferred by the central control are represented.

BusOut / DWC-7 actual values

The process data transferred to the central control are represented.

The representation of the number values is done in the decimal number system. Additionally, the denomination of the data field is represented in clear text corresponding to the parameterisation in group P71xx.

BusIn / DWC-7 BusCommand DW 1-3

Via „Bus CMD" button the detail display of the possible BusCommands are activated. Hereby the respective double word is broken into bits. By pressing the button DW1-DW3 (bottom right) it can be switched between the double words.
The switching takes place through the button „1/3", „2/3" and „3/3" on the right top of the page.
In the first column the bit mask is represented in HEX. In the second column the switch status of the respective command is located and in the last column the digital control command is located.

BusOut / DWC-7 Control Bits 1-3

The detailed representation of control bits DW1 and DW2 will be presented by the control button among Feld Bus Out.

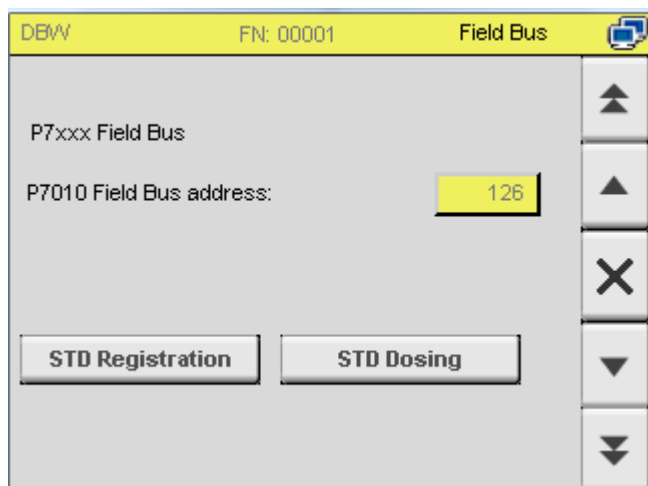The operation takes place as described in the previously image.

BusOut / DWC-7 Control Bits 1-3

The detailed representation of the status double word 1 and 2 will be presented by the status button among Feld Bus Out.
The handling is identical to the double words for control bits and command bits.

8 PARAMETER DESCRIPTION (P7xxx)

8.1 General Fieldbus Parameters (P70xx)

Parameter group „**Fieldbus**" permits adjustment and change of communication possibilities to a central control.

These functions are available only if a Fieldbus option has been acquired and licenced by the manufacturer.

P7010	Fieldbus address:		INT
Selection	Profibus 1..124 Device-Net 1..63	Range:	1-125 1-63
Description:	This parameter defines the Profibus address or the DeviceNet node number..		
Indication:	This parameter is visible only if into the scale computer a licenced Fieldbus card has been installed and correctly recognized by the system.		
Dependence:	ProfiBus card or DeviceNet card installed and licensed. (R9700) In addition, the correct firmware must be loaded in the base unit		

P7015	Baudrate:		INT
Selection	0: 125 kBit/s 1: 250 kBit/s 2: 500 kBit/s	Range:	0-2
Description:	This parameter defines the communication speed on the DeviceNet / CAN bus.		
Indication:	DeviceNet usually does not support auto-scan of the transmission speed, such as ProfiBus.		
Dependence:	DeviceNet card installed and licensed. (R9700) In addition, the correct firmware must be loaded in the base unit		

P7020	IP-Config:		INT
Selection	0: static 1: BOOTP 2: DHCP	Range:	0-2
Description:	This parameter determines the type of IP address for EthernetIP slaves.		

Indication:	If "1:BOOTP" or"2: DHCP" is selected, suitable address servers must be integrated into the network.
Dependence:	EthernetIP- Feldbuskarte eingebaut und lizenziert. (R9700) Zusätzlich muss die richtige Firmware für EthernetIP im Basisgerät geladen sein

P7025	IP-Address:		INT
	Selection: 0.0.0.0	Bereich:	0.0.0.0 – 255.255.255.255
Description:	This parameter determines the IP address of the EthernetIP slave.		
Indication:	A setting is only possible if the selection "0: static" is active in parameter "P7020_IP Config".-		
Dependence:	see P7020		

P7026	Subnetz-Maske:		INT
	Selection: 0.0.0.0	Bereich:	0.0.0.0 – 255.255.255.255
Description:	This parameter determines the Subnet Mask of the EthernetIP slave.		
Indication:	see P7025		
Dependence:	see P7020		

8.2 Setpoints and Commands via Fieldbus (P72xx)

P7200	BusIn DW0:		INT
	Selection: 00: --- 01: --- 02: --- 03: --- 04: Bus Percent 1 05: Bus Percent 2 06: Bus Percent 3 07: Bus Percent 4 08: Bus ABS 1 09: Bus ABS 2 10: Bus ABS 3 11: Bus ABS 4 12: Bus ABS 1 [kg/h] 13: Bus ABS 2 [kg/h] 14: Bus ABS 3 [kg/h] 15: Bus ABS 4 [kg/h] 16: Bus ABS 1 [1/10 kg/h] 17: Bus ABS 2 [1/10 kg/h] 18: Bus ABS 3 [1/10 kg/h] 19: Bus ABS 4 [1/10 kg/h] 20: --- 21: Bus Command 1 22: Bus Command 2 23: Bus Command 3 24: --- 25: Parameter Number 26: Parameter Value 27: --- 28: --- 29: ---	Range:	0-34

30: DWC3/5 CMD
31: DWC3/5 SW1_2
32: DWC3/5 SW3_4
33: DWC3/5 SL1
34: DWC3/5 SL2

Description:	This parameter determines how the 1st input Setpoint-Double word DW0 of the Fieldbus-Set point range is used
Indication:	Please, find details concerning function in the previous chapters.

P7201	**BusIn DW1:**		**INT**
	Selection: see P7200	Range:	0-30

Description:	This parameter determines how the 2nd input Setpoint-Double word DW1 of the Fieldbus-Set point range is used.
Indication:	Please, find details concerning function in the previous chapters.

P7202	**BusSoll DW2:**		**INT**
	Selection: see P7200	Range:	0-30

Description:	This parameter determines how the 3rd input Setpoint-Double word DW2 of the Fieldbus-Set point range is used.
Indication:	Please, find details concerning function in the previous chapters.

P7203	**BusIn DW3:**		**INT**
	Selection: see P7200	Range:	0-30

Description:	This parameter determines how the 4th input Setpoint-Double word DW3 of the Fieldbus-Set point range is used.
Indication:	Please, find details concerning function in the previous chapters.

P7204	**BusIn DW4:**		**INT**
	Selection: see P7200	Range:	0-30

Description:	This parameter determines how the 4th input Setpoint-Double word DW4 of the Fieldbus-Set point range is used.
Indication:	Please, find details concerning function in the previous chapters.

P7205	**BusIn DW5:**		**INT**
	Selection: see P7200	Range:	0-30

Description:	This parameter determines how the 5th input Setpoint-Double word DW5 of the Fieldbus-Set point range is used.
Indication:	Please, find details concerning function in the previous chapters.

P7206	**BusIn DW6:**		**INT**
	Selection: siehe P7200	Range:	0-30

Description:	This parameter determines how the 6th input Setpoint-Double word DW6 of the Fieldbus-Set point range is used.
Indication:	Please, find details concerning function in the previous chapters.

P7207	BusIn DW7:		INT
	Selection: siehe P7200	Range:	0-30
Description:	This parameter determines how the 7th input Setpoint-Double word DW7 of the Fieldbus-Set point range is used.		
Indication:	Please, find details concerning function in the previous chapters.		

P7208	BusIn DW8:		INT
	Selection: siehe P7200	Range:	0-30
Description:	This parameter determines how the 8th input Setpoint-Double word DW8 of the Fieldbus-Set point range is used.		
Indication:	Please, find details concerning function in the previous chapters.		

P7209	BusIn DW9:		INT
	Selection: siehe P7200	Range:	0-30
Description:	This parameter determines how the 9th input Setpoint-Double word DW9 of the Fieldbus-Set point range is used.		
Indication:	Please, find details concerning function in the previous chapters.		

8.3 Actual values and Control/Statusbits via Fieldbus (P74xx)

P7400	BusOut DW0:		INT
	Selection: 00: P3 Capacity [%]	Range:	0-80
	01: Feeder setpoint [%]		
	02: Drive WB [%]		
	03: 0% output [%]		
	04: 50% output [%]		
	05: 100% output [%]		
	06: g1-load [%]		
	07: g2-load [%]		
	08: g3-load [%]		
	09: Scaling 2 [%]		
	10: Setpoint output [%]		
	11: P2 Capacity [%]		
	12: P1 Capacity [%]		
	13: Deviation [%]		
	14: Batch Finestream [%]		
	15: Feeder Deviation [%]		
	16: Distance-FIFO		
	17: Transfervalue 1		
	18:Transfervalue 2		
	19: Gross-Load [%]		
	20: Bin Load [%]		
	21: PreBin-Regulator [%]		
	22: Speed [%]		

23: ---
24: TW [%]
25: g1RR-Load [%]
26: g1R-Load [%]
27: g1L-Load [%]
28: g1LL-Load [%]
29: g1 total [g]
30: g3 total [g]
31: ---
32: BusControlBits1
33: BusControlBits2
34: BusControlBits3
35: BusStatusBits1
36: BusStatusBits2
37: ---
38: ---
39: ---
40: ---
41: Counter A [CountingUnit]
42: Counter B [CountingUnit]
43: Counter C [CountingUnit]
44: Counter A [kg]
45: Counter B [kg]
46: Counter C [kg]
47: Counter A [1/10 kg]
48: Counter B [1/10 kg]
49: Counter C [1/10 kg]
50: P3 Capacity kg/h
51: P3 Capacity 1/10 kg/h
52: ---
53: LC 1 [%]
54: LC 2 [%]
55: LC 3 [%]
56: LC 4 [%]
57: LC5 [%]
58: Load Setpoint [%]
59: PreBin weight in Zone 1
60: PreBin weight in Zone 2
61: PreBin weight in Zone 3
62: PreBin weight in Zone 4
63: PreBin Total weight in percent
64: PreBin Total weight absolute in gram
65: Parameter- Number
66: Parameter- Value
67: ---
68: g1Rright [abs]
69: g1Left [abs]
70: ---
74: AW[%]
75: DWC 3/5 Statuswort
76: DWC3/5 Relaiswort
77: DWC3/5 IW1_2
78: DWC3/5 IW 3_4
79: DWC3/5 IL1
80: DWC3/5 IL2

Description:	This parameter determines which value via the 1st actual value-Double word DW00 of the Fieldbus output range is transferred to a central control.
Indication:	Please, find details concerning function in the previous chapters.

P7401	BusOut DW1:		INT
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 2nd actual value-Double word DW01 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7402	BusOut DW2:		INT
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 3rd actual value-Double word DW02 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

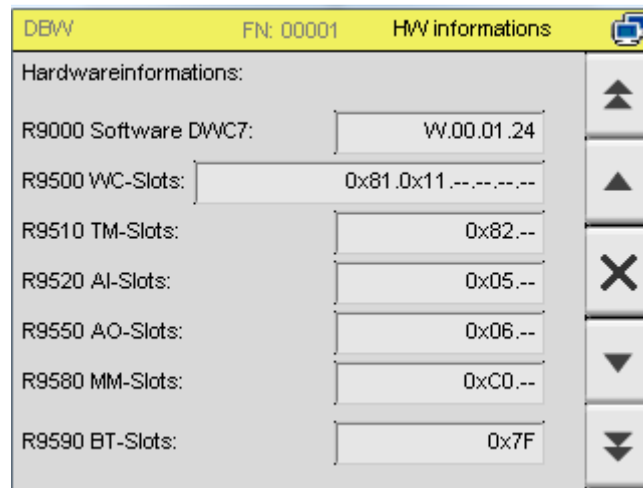| P7403	BusOut DW3:		INT
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 4th actual value-Double word DW03 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7404	BusOut DW4:		INT
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 5th actual value-Double word DW04 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7405	BusOut DW5:		INT
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 6th actual value-Double word DW05 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7406	BusOut DW6:		INT
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 7th actual value-Double word DW06 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7407	BusOut DW7:		INT
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 8th actual value-Double word DW07 of the Fieldbus output range is transferred to a central control.		

Indication:	Please, find details concerning function in the previous chapters.

P7408	**BusOut DW8:**		**INT**
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 9th actual value-Double word DW08 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7409	**BusOut DW9:**		**INT**
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 10th actual value-Double word DW09 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7410	**BusOut DW10:**		**INT**
	Selection: see P7400	Range:	0-80
Description:	This parameter determines which value via the 11th actual value-Double word DW10 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7411	**BusOut DW11:**		**INT**
	Selection: siehe P7400	Range:	0-80
Description:	This parameter determines which value via the 12th actual value-Double word DW11 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7412	**BusOut DW12:**		**INT**
	Selection: siehe P7400	Range:	0-80
Description:	This parameter determines which value via the 13th actual value-Double word DW12 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

P7413	**BusOut DW13:**		**INT**
	Selection: siehe P7400	Range:	0-80
Description:	This parameter determines which value via the 14th actual value-Double word DW13 of the Fieldbus output range is transferred to a central control.		
Indication:	Please, find details concerning function in the previous chapters.		

R9700	**FieldbusSlot:**		**INT**
	Selection: None	Range:	

Beschreibung:	This read only parameter shows the type of the Fieldbus card recognized by the system.
Indication:	This parameter is set by the scale computer itself and is unchangeable by the user.

8.4 Compatiblity-mode to former DWC-5 Systems

In critical cases, the parameters Bus in- and output parameters can be set to compatibility mode, largely represent the bit patterns of old KUKLA DWC-5 devices.
This mode should only be used if a short-term adaptation of the higher-level control program in the PLC is not possible. The DWC-7 communication standard must be used in any case for new systems.
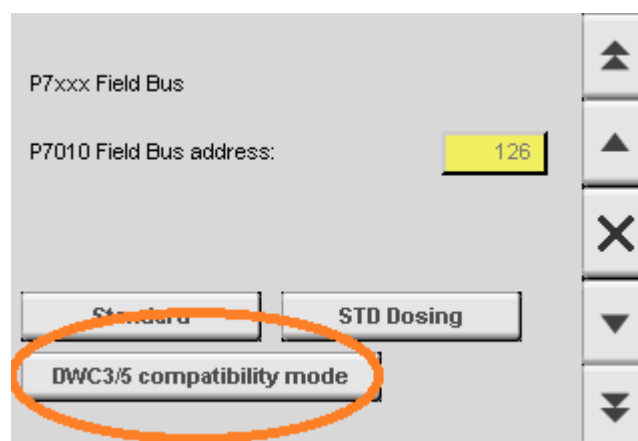
> For new plants, the DWC-7 communication standard must be used in any case.
> The manufacturer took over the old interface as far as possible, various special and extra functions could NOT be transferred for internal technical reasons.
> Therefore, this mode is recommended by the manufacturer only as a last line of defense!

The hardware description files, depending on the bus system used (GSD, EDS, GDML, etc.), must be changed in any case due to hardware IDs differences.
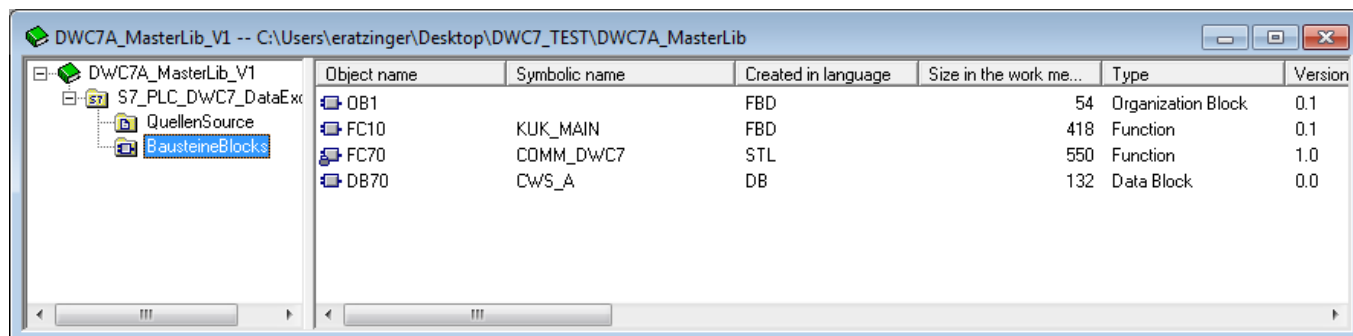
This button automatically parameterizes the data fields (P72xx and P74xx) to the old protocol.

9 Library and Samples for Master-PLC's (Siemens / Allen Bradley)

Sample projects can be downloaded from the manufacturer's website (www.kukla.co.at). They are designed as an integration aid for the end customer.

9.1 Communication to S7- PLC's (ProfiBus / ProfNet)

For easy integration of DWC-7 devices in a local S7 a suitable library can be requested by KUKLA

DWC7A_MasterLib_V1 -- C:\Users\eratzinger\Desktop\DWC7_TEST\DWC7A_MasterLib						
Object name	Symbolic name	Created in language	Size in the work me...	Type	Version
OB1		FBD	54	Organization Block	0.1
FC10	KUK_MAIN	FBD	418	Function	0.1
FC70	COMM_DWC7	STL	550	Function	1.0
DB70	CWS_A	DB	132	Data Block	0.0

Tree view:
- DWC7A_MasterLib_V1
  - S7_PLC_DWC7_DataExc
    - QuellenSource
    - BausteineBlocks

Following blocks are relevant:

FC 10 calls on the KUKLA prepared real communication block FC70.
DB70 contains the communication data's.

> Note the bit order of the command and status bit fields!
> See previous chapter, the first bit (00 ....) Starts at Siemens S7 controllers typically at the most significant address (3.0-3.7,2.0-2.7, 1.0-1.7,0.0-0.7).
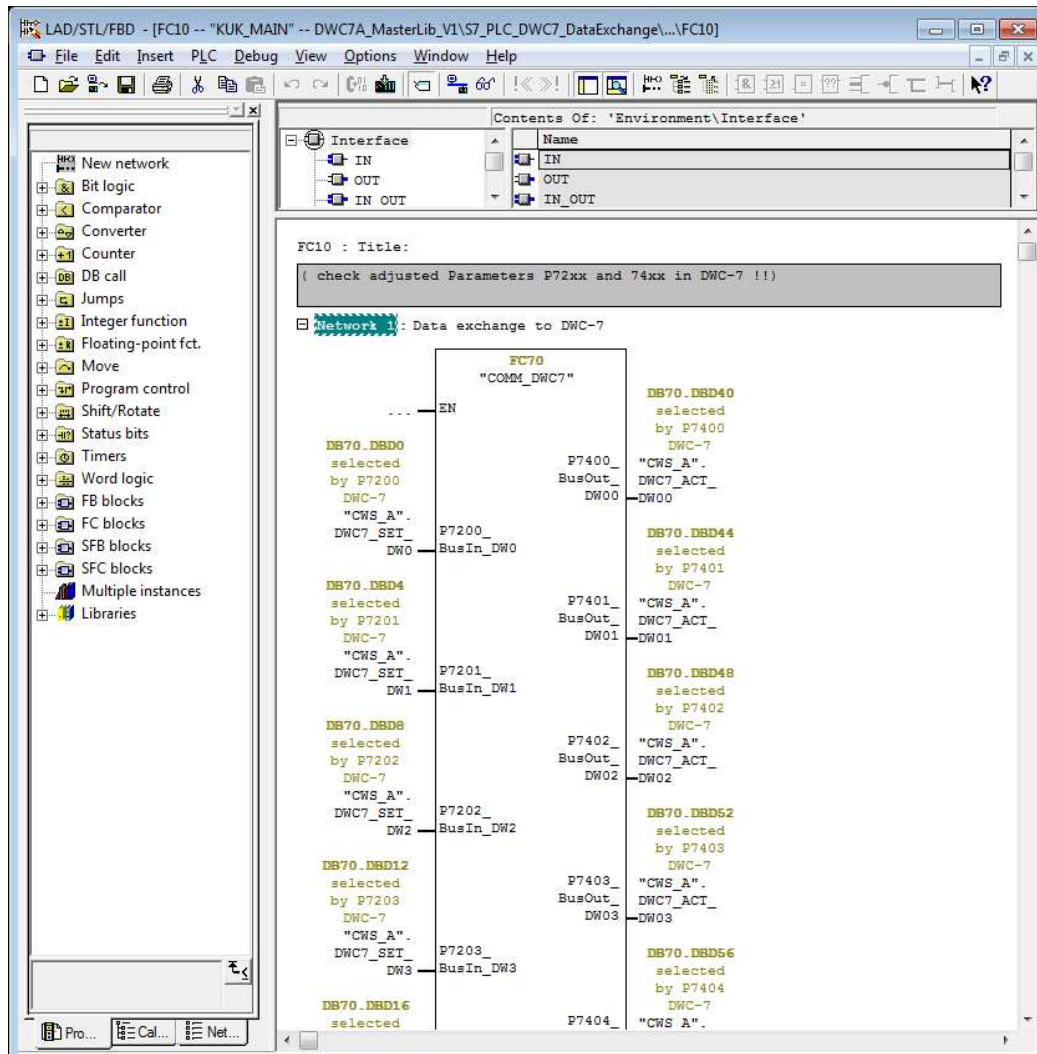
All nominal values, who will be sent from SPS to DWC-7, are connected on the left chip side. All process data values, who be sent from the scale to the central SPS, are connected on the right side.

In this example the dates will be saved in data block DB70, the user can also connect other data blocks or flags.

Very important is the right connection of the variables Adr_In and Adr_Out at the bottom of the block.
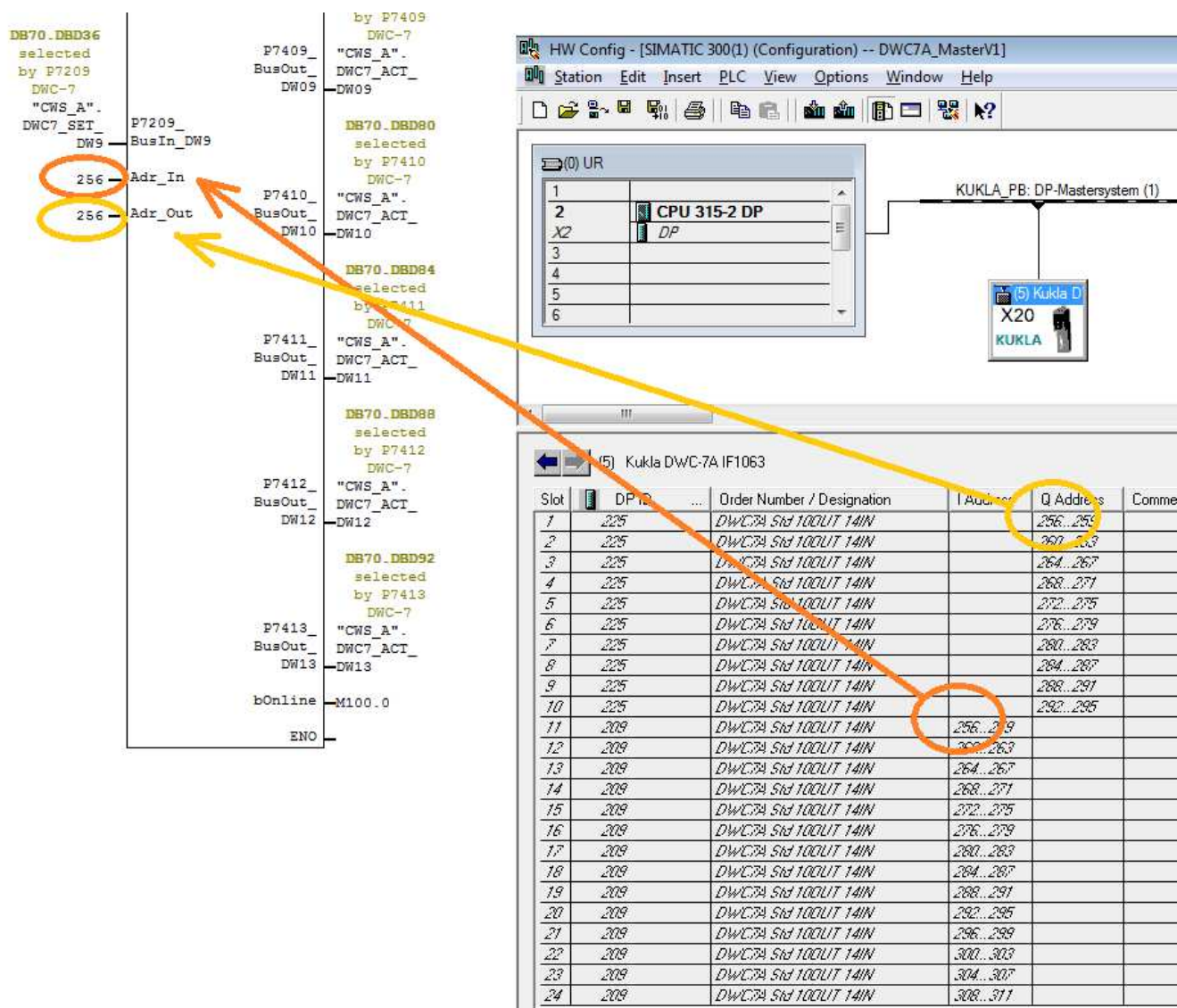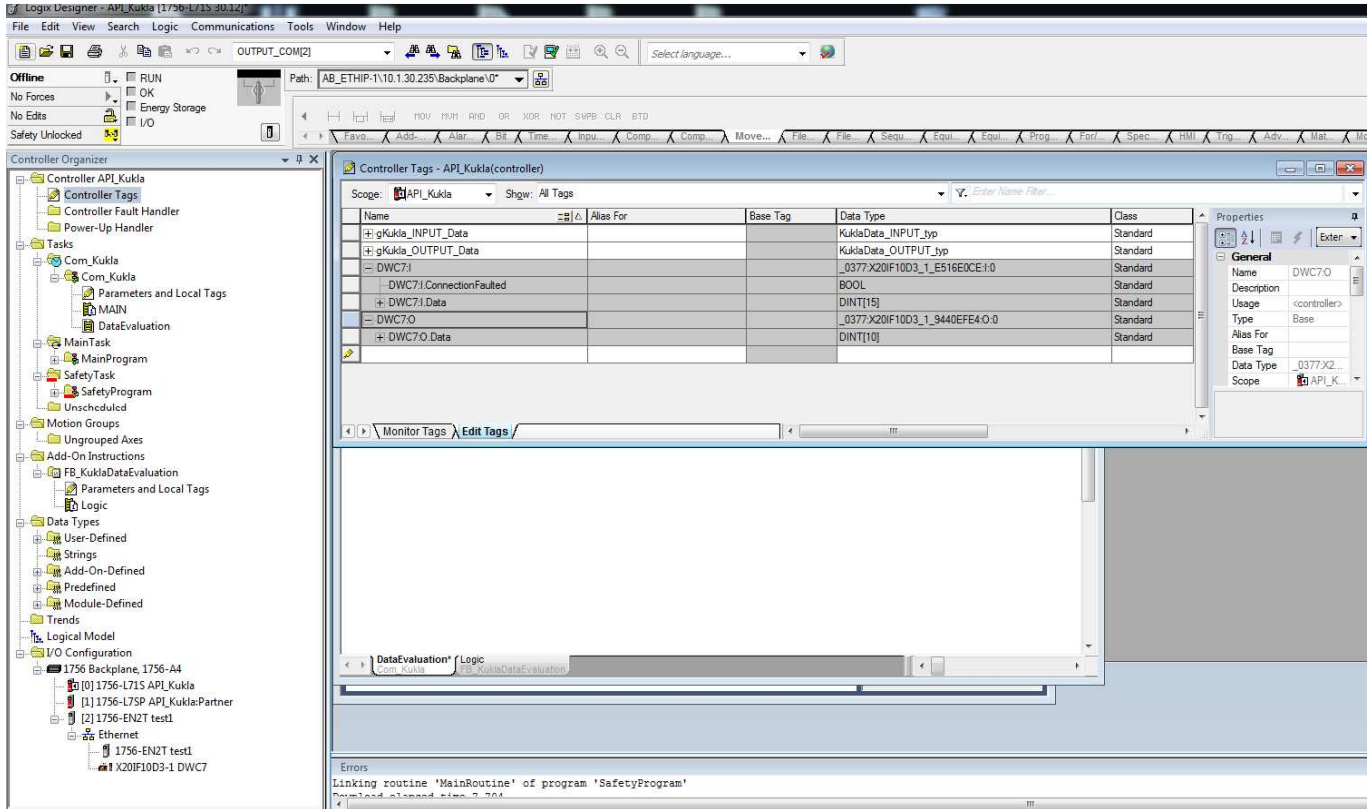
The basic addresses provide the connection between the decentralized peripherals and the communication block FC70. If more DWC-7 are coupled onto one SPS are the necessarily result a new address for every new device.

For each additionally DWC-7 on the same bus the FC70 must be called again in a new network. In this case of course new memory variables have to be connected (e.g. by copy DB70 to DB7x).

9.3 Communication to A&B PLC's (DeviceNet / EthernetIP)

For communication with Allen Bradley controllers, a general sample project is available. It is a template for the data integration. However, this sample project must be adapted if necessary.

In the template, two communication structures are created, one defines the receive data, the other the send data to the DWC-7 base unit.
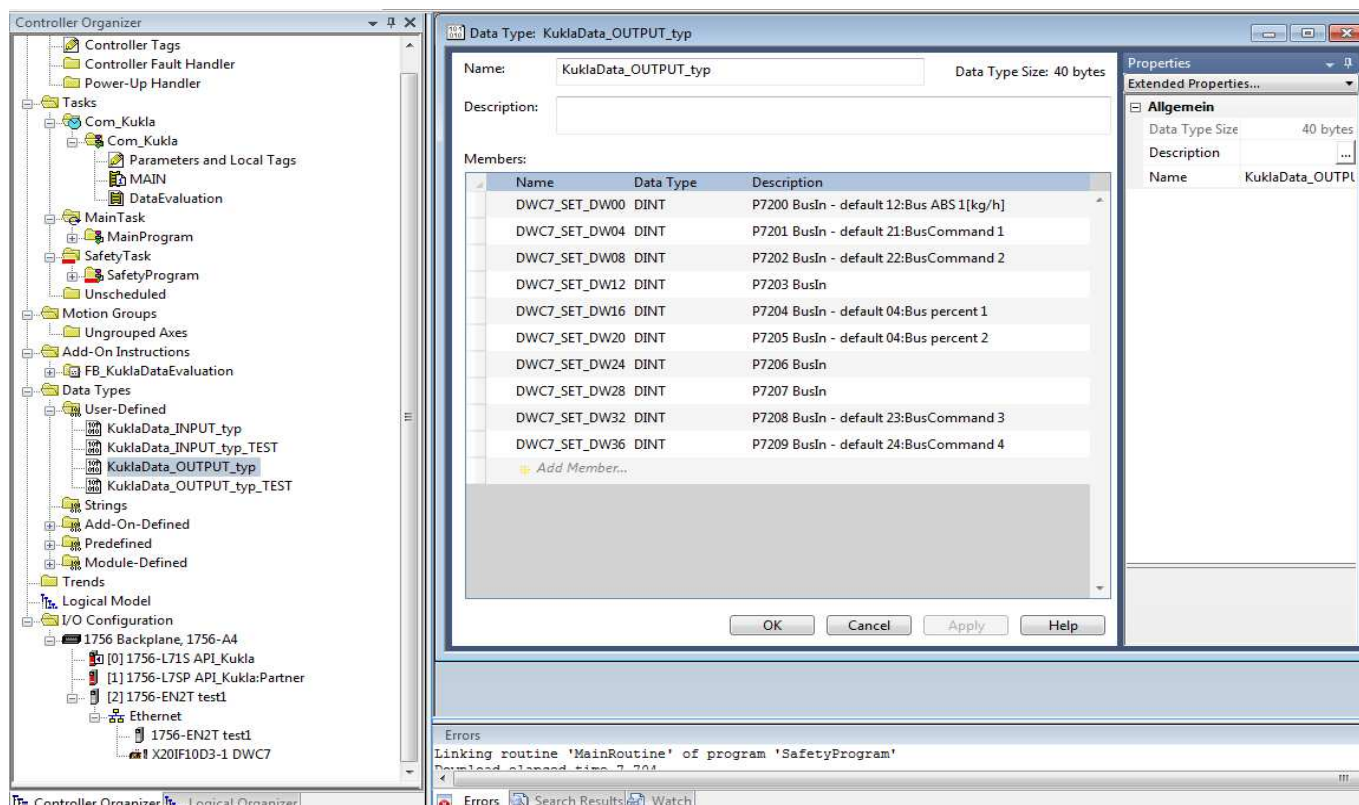
Note the bit order of the command and status bit fields!
See previous chapter, the first bit (00 ....) is usually at the lowest byte address (0.0-0.7,1.0-1.7, 2.0-2.7,3.0-3.7) at AB controllers.

Internally, the transmission data of the central control is structured as follows:
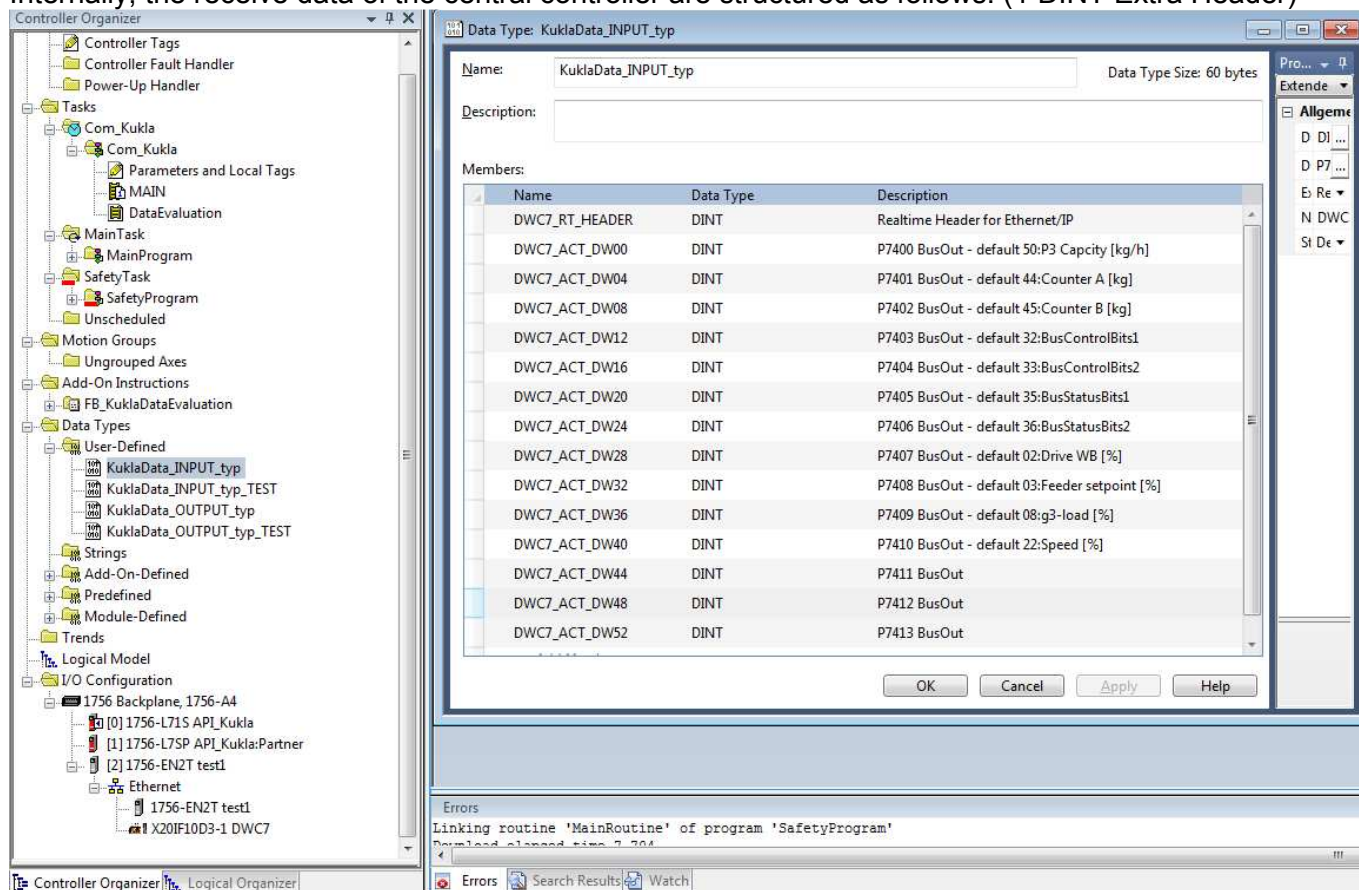
Data Type: KuklaData_OUTPUT_typ

Name: KuklaData_OUTPUT_typ   Data Type Size: 40 bytes

Description:

Members:

Name	Data Type	Description
DWC7_SET_DW00	DINT	P7200 BusIn - default 12:Bus ABS 1[kg/h]
DWC7_SET_DW04	DINT	P7201 BusIn - default 21:BusCommand 1
DWC7_SET_DW08	DINT	P7202 BusIn - default 22:BusCommand 2
DWC7_SET_DW12	DINT	P7203 BusIn
DWC7_SET_DW16	DINT	P7204 BusIn - default 04:Bus percent 1
DWC7_SET_DW20	DINT	P7205 BusIn - default 04:Bus percent 2
DWC7_SET_DW24	DINT	P7206 BusIn
DWC7_SET_DW28	DINT	P7207 BusIn
DWC7_SET_DW32	DINT	P7208 BusIn - default 23:BusCommand 3
DWC7_SET_DW36	DINT	P7209 BusIn - default 24:BusCommand 4
Add Member...		

Internally, the receive data of the central controller are structured as follows: (1 DINT Extra Header)
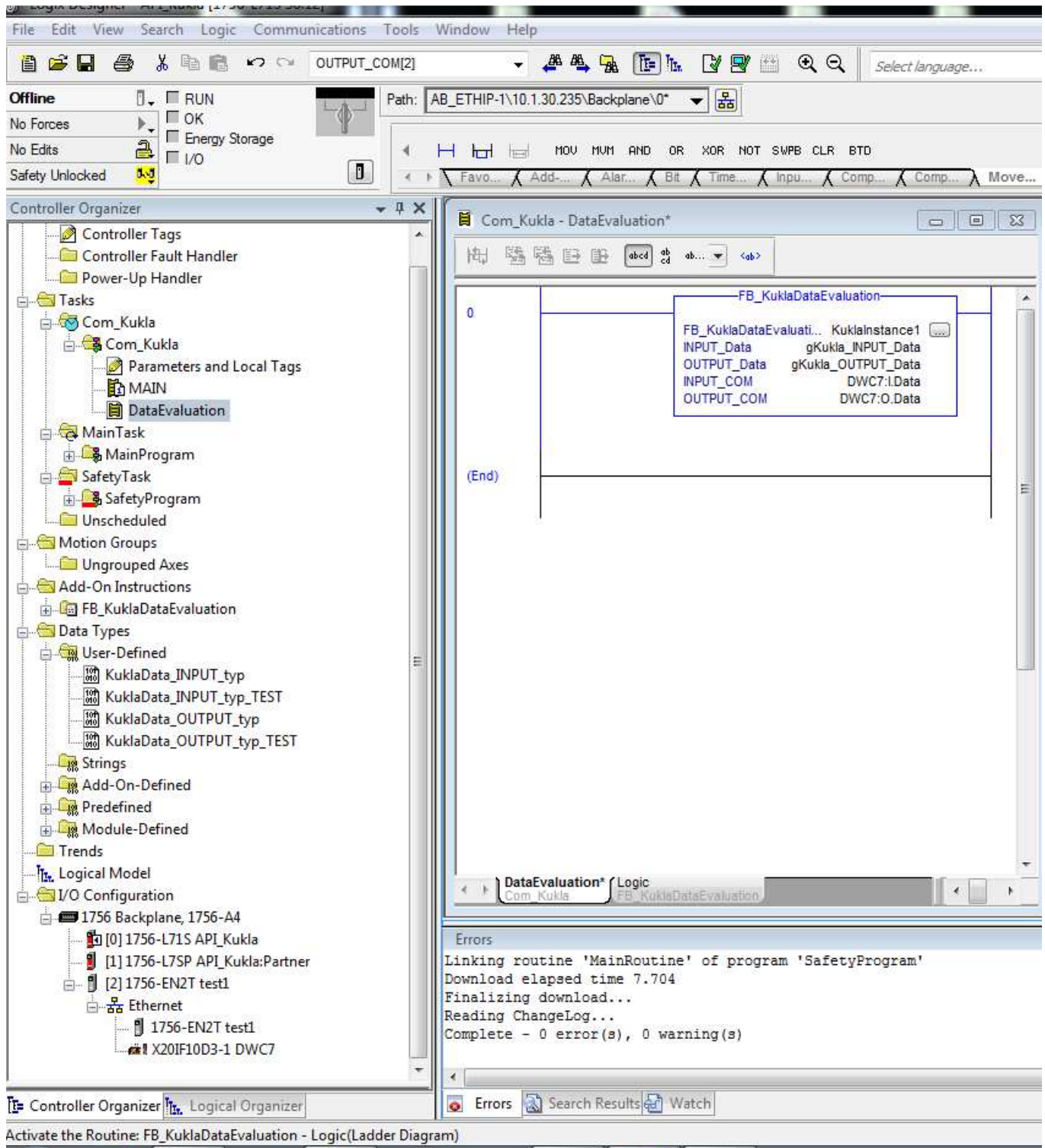
Data Type: KuklaData_INPUT_typ

Name: KuklaData_INPUT_typ   Data Type Size: 60 bytes

Description:

Members:

Name	Data Type	Description
DWC7_RT_HEADER	DINT	Realtime Header for Ethernet/IP
DWC7_ACT_DW00	DINT	P7400 BusOut - default 50:P3 Capcity [kg/h]
DWC7_ACT_DW04	DINT	P7401 BusOut - default 44:Counter A [kg]
DWC7_ACT_DW08	DINT	P7402 BusOut - default 45:Counter B [kg]
DWC7_ACT_DW12	DINT	P7403 BusOut - default 32:BusControlBits1
DWC7_ACT_DW16	DINT	P7404 BusOut - default 33:BusControlBits2
DWC7_ACT_DW20	DINT	P7405 BusOut - default 35:BusStatusBits1
DWC7_ACT_DW24	DINT	P7406 BusOut - default 36:BusStatusBits2
DWC7_ACT_DW28	DINT	P7407 BusOut - default 02:Drive WB [%]
DWC7_ACT_DW32	DINT	P7408 BusOut - default 03:Feeder setpoint [%]
DWC7_ACT_DW36	DINT	P7409 BusOut - default 08:g3-load [%]
DWC7_ACT_DW40	DINT	P7410 BusOut - default 22:Speed [%]
DWC7_ACT_DW44	DINT	P7411 BusOut
DWC7_ACT_DW48	DINT	P7412 BusOut
DWC7_ACT_DW52	DINT	P7413 BusOut

The data exchange itself takes place in the ladder diagram:

Notes: