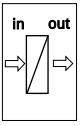
Level and Pressure

Operating Instructions

VEGACOM 557

Profibus DP



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Safety information

Please read this manual carefully, and also take note of country-specific installation standards (e.g. the VDE regulations in Germany) as well as all prevailing safety regulations and accident prevention rules.

For safety and warranty reasons, any internal work on the instruments, apart from that involved in normal installation and electrical connection, must be carried out only by qualified VEGA personnel.

Note Ex area

Please note the approval documents (yellow binder), and especially the included safety data sheet.

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1 Product description

1.1 Application

The VEGACOM 557 is an efficient and easy-to-use interface converter (Gateway) for your measurement applications. It is used for conversion of the VEGA-specific protocols of DISBUS and LOGBUS into standard data formats.

The existing version is used for connection of level or pressure measuring systems to Profibus DP systems such as
- processing systems (DCS)
- personal computers (PC)
- stored program control (PLC).

In addition, it is used for connecting a PC for configuration or visualisation via the VEGA adjustment software.

If connection is made to Profibus DP systems, there is the possibility of calling up measurement data and status information of the measuring systems via the master of the Profibus DP system. The coupling of the Profibus DP is made via the connections on the rear of the instrument. This data traffic requires that special measures (described in this manual) be taken in setting up the master of the Profibus DP. The data received in the master can be visualised there or further processed for control purposes. In restricted volume, signal conditioning instrument-specific parameters can be outputted, modified and returned again.

Via the PC interface on the front of VEGACOM 557, the VEGA visualisation software „Visual VEGA“ or the VEGA configuration software „VEGA Visual Operating“ (VVO) can be operated. For these applications, the coupling between VEGACOM 557 and a PC is made directly with the connection cable between the RS 232 interface (PC) on the front of VEGACOM 557 and a standard Port (e.g. COM1) of your PC. There is also the possibility to provide a connection via modems.

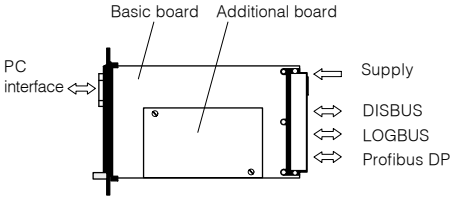
1.2 Configuration

The component VEGACOM 557 is designed in 19" technology with 5 TE width (1 TE = 5.08 mm) acc. to DIN 41 494. It can be used:
- in carrier BGT 596
- in VEGALOG 571 carrier BGT LOG 571
- in housing type 505.

The electrical connection of supply voltage, DISBUS and Profibus DP is made via a plug connection acc. to DIN 41 612 on the rear of the component. The connection to LOGBUS is made via an additional 5-pole plug-connector mounted to the DIN-socket.

A 9-pole SUB-D plug marked “PC” is located on the front panel of VEGACOM 557. It is used for connection of a PC via RS 232C to VEGACOM 557.

The component consists of two boards:
- the basic board
- the additional board.



VEGACOM 557 connections

On the basic board, you will find the power supply unit, the PC interface, the DISBUS/LOGBUS interface as well as the connections for the Profibus DP.

The additional board is screwed to the basic board and includes the hardware of the Profibus DP interface as well as the protocol specific programs.

1.3 Functions

The VEGACOM 557 interface converter can be integrated into the VEGA level or pressure measuring system in two different ways:

either
- as DISBUS participant

or
- as LOGBUS participant.

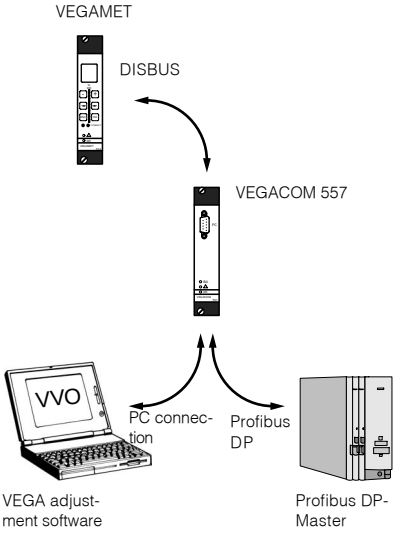
In both cases, VEGACOM 557 operates as passive participant and provides measured data and status information of the connected VEGA signal conditioning instruments via the Profibus DP. By the use of a standar dised protocol (Profibus DP), it is possible to connect via this interface any individual Profibus DP compatible processing system.

Alternatively, it is possible to connect a PC with VEGA adjustment software via the SUB-D-plug marked "PC" on the front panel of VEGACOM 557. VEGA adjustment software is actually available as two different Windows applications.

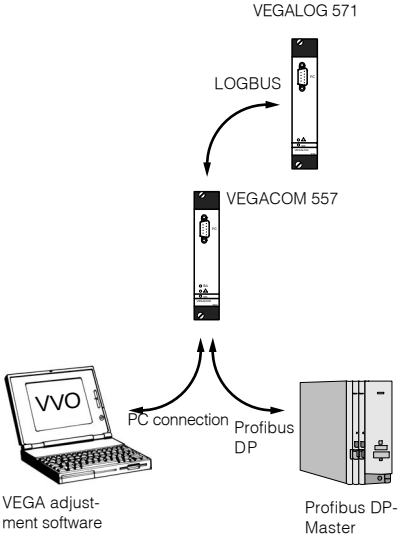
VVO = VEGA Visual Operating
For configuration and parameter adjustment of the connected VEGAMET or VEGALOG processing systems

VV = Visual VEGA
For visualising and recording of measured values of complete (multiple) vessel installations.

The following pictures show the basic connection possibilities of VEGACOM 557.



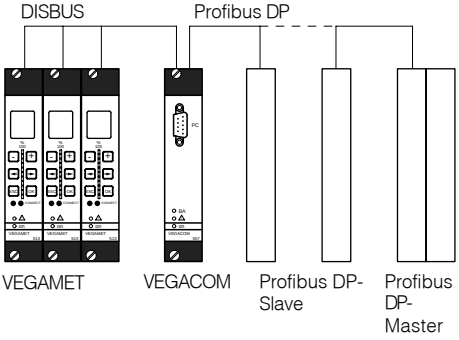
VEGACOM 557 as DISBUS participants



VEGACOM 557 as LOGBUS participant

VEGACOM 557 on DISBUS

VEGAMET series 500/600 signal conditioning instruments transmit via the DISBUS cyclically measured data and status information, so called PC/DCS telegrams. VEGACOM 557 receives as participant on the DISBUS these data and makes them available (in buffer memory) for collection via the Pr ofibus DP.



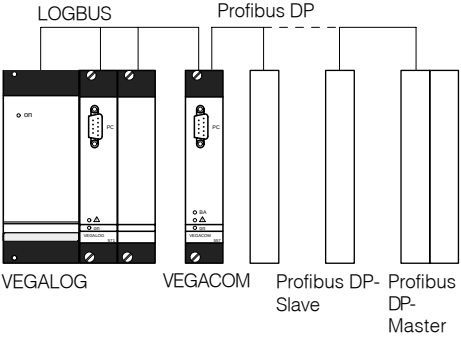
Connection VEGACOM 557 to DISBUS

If a PC is connected to the PC interface (front interface) of VEGACOM 557, this instrument transfers acyclically (on request by the VEGA configuration software VVO) measurement loop parameters fr om or to VEGAMET .

Max. two VEGACOM 557 can be connected to the same DISBUS. For clear identification, different instrument addresses should be depending on both instruments.

VEGACOM 557 on LOGBUS

Data are exchanged continuously on the LOGBUS between the individual components of VEGALOG 571. VEGACOM 557 receives as participant of this LOGBUS PC/DCS telegrams including the measured values and status information and makes them available (in buffer memory) for collection via the Profibus DP.



Connection VEGACOM 557 to LOGBUS

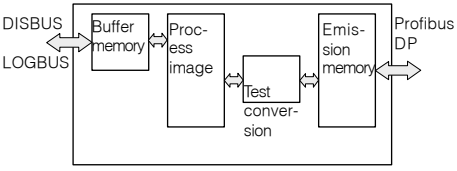
If a PC is connected to the PC interface (front interface) of VEGACOM 557, this instrument transfers acyclically (on request by the VEGA configuration software VVO) measurement loop parameters from or to VEGALOG 571.

Max. two VEGACOM 557 can be connected to the same LOGBUS. The addressing for clear identification is made automatically on LOGBUS.

VEGACOM 557 on Profibus DP
The data communication between VEGACOM 557 and Profibus DP-Master is only carried out if initiated by the master, which can enquire the requested information by means of special control commands.

The data from DISBUS/LOGBUS are first written in a buffer memory of VEGACOM 557. The data set is transferred from this buffer memory into a process image. The protocol conversion software enquires the stored data cyclically from the individual storage areas.

The data sets are checked and converted into the Profibus DP data format. After the conversion, the data are transferred into the emission memory and are sent from there to the Profibus DP. The PROFIBUS DP transmits the data to the DP-Master .



Function VEGACOM 557

VEGACOM 557 with VVO or VV

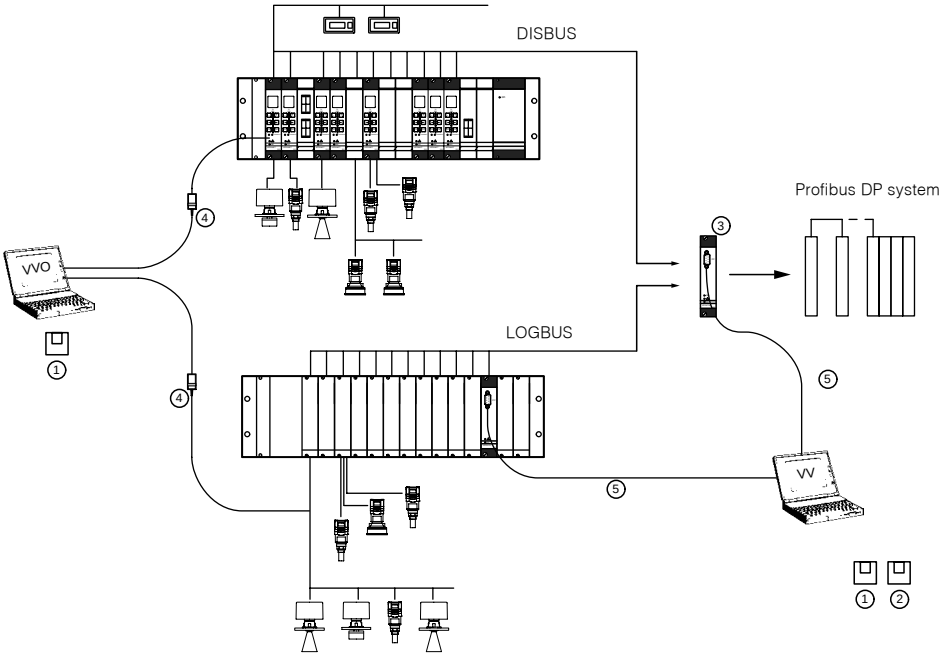
Direct connection
As an alternative to the Profibus DP communication, a PC can be connected via the PC interface (SUB-D-plug in the front panel of VEGACOM 557). By means of the adjustment and indicating software VEGA Visual Operating (VVO), the parameter adjustment can be made on the signal conditioning instruments connected to VEGACOM 557. The adjustment concept includes the user -friendly configuration and parameter adjustment of the measuring system or the sensor with the following instruments:
- VEGAMET series 500/600 signal conditioning instruments
- VEGALOG 571 processing system
- VBUS ultrasonic/radar sensors.

The adjustment is menu-driven and window orientated. No matter if a radar sensor , several connected signal conditioning instruments or a VEGALOG should be adjusted via the PC, the procedure is always the same. As another possibility, measured values and fault signals of the entire processing facility can be recorded and shown graphically by means of the visualisation software VISUAL VEGA (VV). Tools for processing and analysis of history data are also available.

The configuration of the measurement loop comprises, depending on the connected instruments, e.g. the determination of output functions or the configuration of individual outputs or inputs. The user orientated editing of measurement loops is supported by graphic means, such as e.g. vessel drawings and pictographs that adapt to the selected general conditions and options.
With the graphic support also more complex parameter adjustments such as e.g. the input of a linearisation curve by means of index markers can be done with ease.

Connection via modem
The PC interface supports, beside the direct connection of a PC, also the operation via modems. With this additional function, remote parameter adjustment or remote diagnostics of VEGA systems via VVO are possible. Together with the visualisation software Visual VEGA, even remote visualisations can be carried out.

Complete measuring system with digital communication and networking



Measuring system with digital communication and networking

Explanation:

1 VEGA Visual Operating (VVO)
Adjustment software for the PC for the user-friendly configuration and parameter adjustment of VEGA instruments
- VEGALOG 571 directly via RS 232 connection cable on the CPU card or VEGACOM 557
- several VEGAMET via VEGACOM 557 or individually via VEGACONNECT
- VEGASON, VEGAPULS via VEGACONNECT on the signal line or on the sensor

2 Visual VEGA (VV)
PC visualisation software for presentation of measurement data from VEGA instruments in a graphical or tabular form. Integration of individual measurement loops into groups, saving of fault signals and measured values (recorder function). Suitable for networks

3 VEGACOM 557
Interface converter for conversion of VEGA specific protocols into standar d data formats. Suitable for connection to the DISBUS output of VEGAMET series 500/600 signal conditioning instrument or the LOGBUS of VEGALOG 571 processing system.

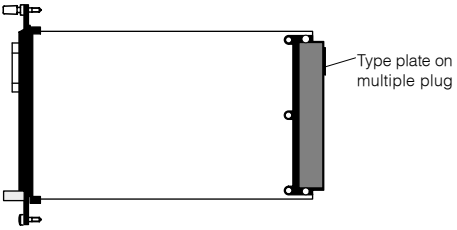
4 VEGACONNECT 2
Connection cable (interface converter) between VEGA instruments (VEGASON, VEGAPULS or VEGAMET) and a PC in conjunction with the adjustment software VEGA Visual Operating.

5 RS 232 connection cable (interlink cable)
Connection cable between PC and VEGALOG 571-CPU or VEGACOM 557

1.4 Type plate and order code

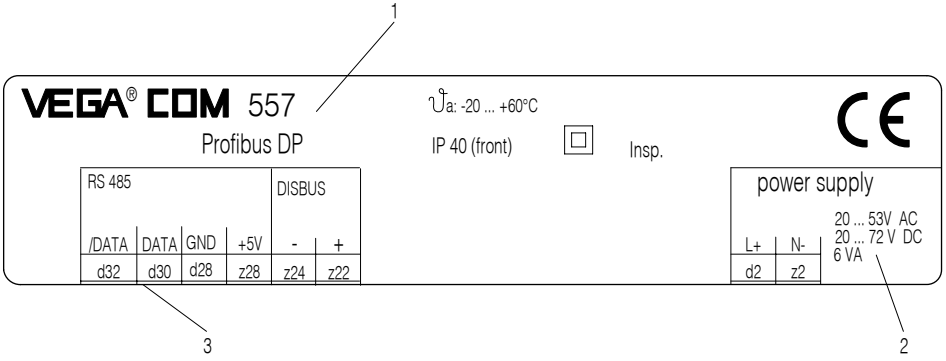
Type plate

Before mounting and electrical connection, please check if you are using the correct version of VEGACOM 557. Please note the type plate, located below the multiple plug.



The type plate contains important data required for electrical connection. The configuration and the components of the type plate are explained in the illustration below.

Note:
The serial number of your VEGACOM is on the rear of the plug connector.



1 Version: Profibus DP
2 Supply voltage
3 Terminal assignments Profibus DP interface (RS485)

1.5 Technical data

Power supply

Supply voltage	U_{nom} = 24 V AC (20 … 53 V), 50/60 Hz or = 24 V DC (20 … 72 V)
Power consumption	approx. 6 VA
Fuse	1 A, slow-blow

Electrical connection

Component	multiple plug acc. to DIN 41 612, series F 48 pole (d, b, z) with coding holes
Module in carrier BGT 596 or BGT LOG 571	suitable multipoint connector acc. to DIN 41 612 with connection via standard technologies
Housing type 505	via screw terminals max. 1 x 1.5 mm ^{2}

Indicating elements

LED on front panel	green „BA“: Profibus activity red: failure, freeze mode green „on“: operating mode

Meas. data input DISBUS

Data transmission	DISBUS (digital data transmission)
Connection cable	2-wire standard cable (shielded)
Cable length	max. 1000 m

Measuring data input LOGBUS

Data transmission	LOGBUS (digital data transmission)
Connection cable	connection via BUS-plug

PC interface

Interface standard	RS 232C
Cable length	max. 15 m
Transmission rate in baud	300, 600, 1200, 2400, 4800, **9600**, 19200, 38400
Transmission format	8 data bits, 1 stop bit, no parity or even parity
Plug on front panel	SUB-D-plug connector, 9 pole, pins

Profibus DP interface (RS 485)

Standards conformity	to DIN 19 245, part 3
Interface standard	RS 485
Network topology	linear bus (active bus connection on both ends)
Bus access	hybrid bus access protocol acc. to DIN 19 245, part 1
Max. number of bus participants	126 master and slave instruments
Communication structure	point-to-point or multicast
Communication procedure	cyclical or acyclical
Max. cable length	
- without repeater [1]	
Baud rate (kBit/s)	9.6 19.2 93.75 187.5 500 1500 12000
cable length (m)	1200 1200 1200 1000 400 200 100
- with repeater	can be extended to the km-range
Connection cable	screened 2-wire, twisted in pairs
Transmission	half-duplex, serially asynchronous, slip resistant synchronization
Transmission rate [2]	9.6; 19.2; 45.45; 93.75; 187.5; 500; 1500; 3000; 6000; 12000 Kbits/s
Telegraph formats	acc. to DIN 19 245, part 1
E/A-data per DP-Slave	VEGACOM 50E/2A Byte or 6E/6A Byte
Data backup	Hamming distance HD = 4
Fuse +5V	100 mA, slow-blow

Electrical protective measures

Protection:	
not mounted	IP 00
in carrier BGT 596	
or BGT LOG 571	
- front side completely equipped	IP 40
- upper and lower side	
BGT 596	IP 00
BGT LOG 571	IP 20
- wiring side	IP 00
in housing type 505	
- front side	IP 40
- other sides	IP 30
Protection class	II (in housing type 505)
Overvoltage category	II

Electrical separation measures

Reliable separation acc. to VDE 0106, part 1 between power supply, LOGBUS, DISBUS, PC-connection and respective interface

- reference voltage	250 V
- test voltage	2 kV

[1] Repeater = line amplifier
[2] Baud rate is automatically adjusted

CE conformity CE

VEGACOM 557 meets the protective regulations of EMC (89/336/EWG) and NSR (73/23/EWG). The conformity has been judged acc. to the following standards:

EMC	Emission	EN 50 081 - 2: 1993
	Susceptibility	EN 50 082 - 2: 1995
NSR		EN 61 010 - 1: 1993

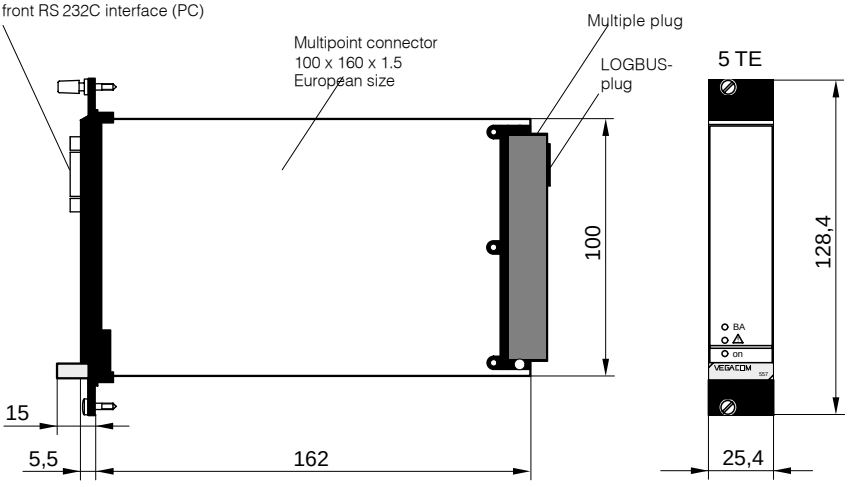
Ambient conditions

Permissible ambient temperature	-20°C … +60°C
Storage and transport temperature	-20°C … +85°C
Humidity	93 %, T = 40°C acc. to DIN/IEC 68-2-3
Shock	2 … 100 Hz, 0.7 g

Mechanical data

Series	module unit for - carrier BGT 596 - carrier BGT LOG 571 - housing type 505
Dimensions, not mounted	W = 25.4 mm (5 TE), H = 128.4 mm, D = 166 mm
Weight	approx. 550 g

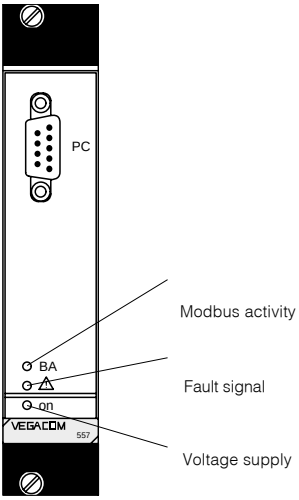
1.6 Dimensions



1.7 Indicating and adjustment elements

As diagnostic aid, VEGACOM 557 is equipped with three LEDs. These are located on the instrument front panel. In addition, the basic board, as well as the additional board of VEGACOM 557 are equipped with switches (DIP switch or hook switch) for configuration of the available interfaces.

Indicating elements/Diagnostics LEDs



Front of VEGACOM 557

Meaning of the LEDs:

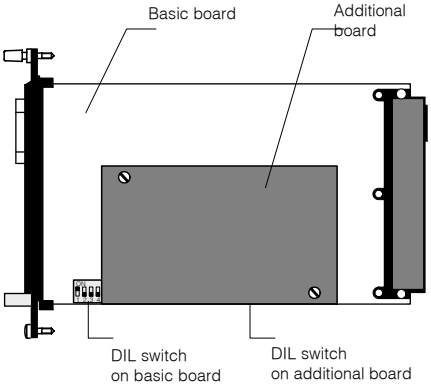
VEGA ASCII active:
- green LED lights in case of valid data exchange

Fault signal:
- red LED flashing: DISBUS/LOGBUS-error
- irregularly flashing: no PC/DCS outputs assigned
- permanent light: hardware error or special function „Freeze Mode“

Voltage supply:
- green LED lights, operating voltage on.

Adjustment elements

The adjustment elements are located on the basic board or on the additional board.
A 6-pole DIL switch block on the basic board is used for adjustment of the fr ont PC interface. The DIL switch and hook switch on the additional board are used for adjustment of the Profibus interface.



Side view of VEGACOM 557

Special function “Freeze Mode“

For diagnostic purposes on VEGA processing systems VEGAMET and VEGALOG, the process image can be “frozen“ in VEGACOM 557 with the adjustment software VVO. This enables the possibility of carrying out maintenance work on the VEGA system, without disturbing the higher -priority pr ocessing system.

For activating the Freeze Modes, a PC must be connected directly to the PC interface of VEGACOM 557 and the Freeze Mode must be switched on under VVO in the menu „Configuration - Measuring system “.

Attention:

Before activating this function, it must be ensured that during this mode, no disastrous consequences are to be expected for production processes (during this mode, no level values etc. are updated).

2 Mounting and electrical connection

2.1 Mounting instructions

The gateway VEGACOM 557 can process measured data and status information in two different ways:
- via DISBUS (from measuring systems with VEGAMET)
- via LOGBUS (from measuring systems with VEGALOG).

For DISBUS configurations, VEGACOM 557 can be either mounted into carrier BGT 596 or housing type 505.

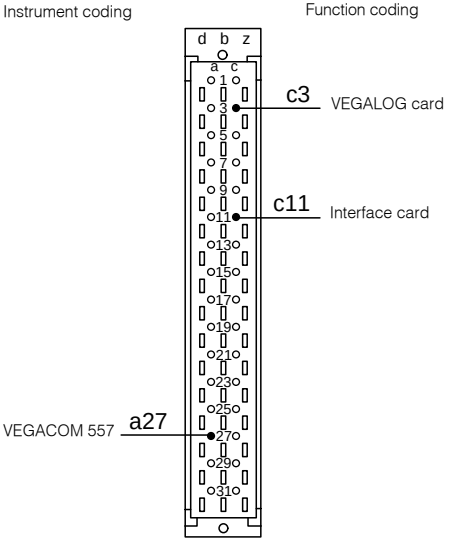
In conjunction with LOGBUS, VEGACOM 557 in is mounted into carrier BGT LOG 571. The location is individually selectable, the system adapts automatically when rebooting (autoconfiguation).

Coding
A mechanical coding system prevents mixing up the different module cards in the carrier or in the housing.

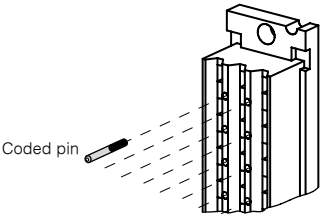
The coding system consists of:
- three coded pins in the multipoint connector
- three holes in the multiple plug of VEGACOM 557.

The coded pins are attached to the module or the housing. The plug-in socket must be equipped by the user with the coded pins according to the following table and diagram.

	Instrument coding	Function coding
VEGACOM 557	a27	c3/c11



Positioning of the coded pins



Plug-in socket of VEGACOM 557

2.2 Mounting in carrier and housing

BGT 596 or BGT LOG 571

For mounting, a slot module must be provided at the location. A slot module consists of:
- a multipoint connector acc. to DIN 41 612, series F, 33-pole (d, b, z)
- two screws
- three coded pins
- two guide rails.

The multipoint connector is available in the following versions:
- Wire-Wrap, standard connection 1.0 mm x 1.0 mm
- plug connection 2.8 mm x 0.8 mm
- Termi-Point standard connection 1.6 mm x 0.8 mm
- soldering connection
- screw terminals 0.5 mm².

For mounting the module, please note the operating instructions of the carrier .

Housing type 505, type 506

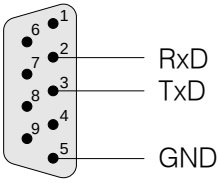
This housing is already equipped with a multipoint connector. Before mounting, please check if the housing is equipped with a power supply unit or not.

The connection is made via screw terminals with max. 1.5 mm². Further details are stated in the operating instructions "Housing type 505, type 506 ".

2.3 Wiring plan VEGACOM 557

PC interface in front panel (SUB-D-plug)

The PC interface of VEGACOM 557 is used exclusively for connection of computer systems with VEGA adjustment software via a COM-Port. The PC interface is based on the RS 232C standard and is assigned as follows.

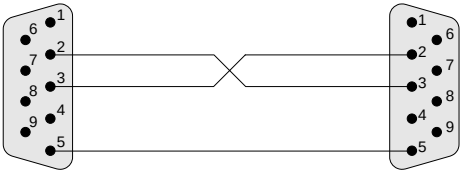


Pin assignments of the PC interface of VEGACOM 557

Pin	Description		I/O
2	RxD	receive data	I
3	TxD	transmit data	O
5	GND	ground	–

Note:
With a direct connection to the computer system, VEGACOM 557 works without hardware handshake.

Direct connection
For direct connection of a PC to the PC inter - face of VEGACOM 557, the interlink (or a standard) cable available from VEGA with 9-pole plugs on both ends should be used. The pin assignments of the interlink cable are shown in the diagram.

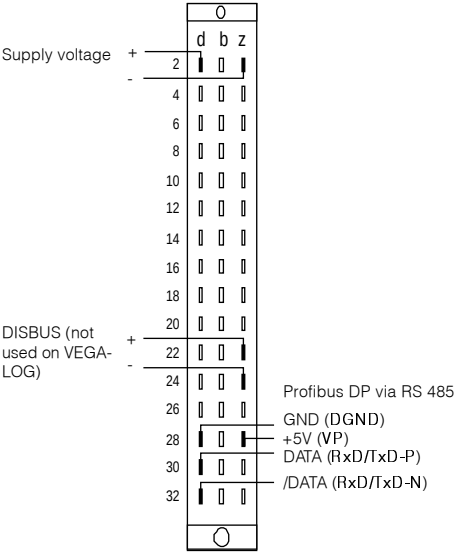


Wiring proposal for interlink cable

Connection via modem
For remote parameter adjustment, it is possible to connect the PC interface via a modem. In such a case, the modem cable that comes with the respective modem should be used. Modem operation is supported by VEGACOM 557 from software version 2.11. Further information on the remote parameter adjustment is stated in the operating instructions „Remote parameter adjustment “.

Connections of the multiple plug (rear)

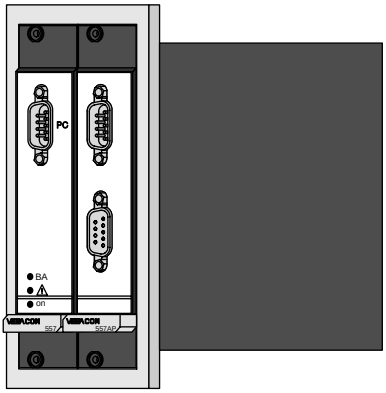
For connection of VEGACOM 557 to the existing Profibus DP system, a RS 485 interface is available. The following diagram shows the connections of the RS 485 interface, the power supply of the instrument and the connection to the VEGA system.



Multiple plug (rear of VEGACOM 557)

2.4 Mounting and installation instructions with VEGACOM 557AP

As an option, VEGACOM 557 can be extended with the adapter print VEGACOM 557AP. The adapter print VEGACOM 557AP consists of a module card with 5 TE width and two modules connected to a back-panel print for carrier BGT 596 or BGT LOG 571.



With the adapter print card it is possible to put the Profibus DP interfaces of VEGACOM 557 at the front of the carrier. On the front of the adapter print card, the Profibus DP interface is available as a 9-pole SUB-D-plug and as 9-pole SUB-D-socket. The required interface type must be stated when ordering VEGACOM 557AP.

The following interface types are available:
- RS 485 (Profibus DP)

Keep in mind that for Profibus, the interface type RS 485 is necessary!
The pin assignments of the SUB-D-plug and the SUB-D-socket are stated in the schedules.

Pin assignments VEGACOM 557AP

Pin-Nr.	RS 485
1	-
2	-
3	DATA (RxD/TxD-P)
4	-
5	GND (DGND)
6	+5V (VP)
7	-
8	/DATA (RxD/TxD-N)
9	-

9-pole SUB-D-plug

Pin-Nr.	RS 485
1	-
2	-
3	DATA (RxD/TxD-P)
4	-
5	GND (DGND)
6	+5V (VP)
7	-
8	/DATA (RxD/TxD-N)
9	-

9-pole SUB-D-socket

Mounting instructions for VEGACOM 557AP

The two modules connected to the back-panel print consist of:
- two multipoint connector acc. to DIN 41 612, series F, 48-pole (d, b, z) connected via the back-panel print
- four screws
- four coded pins
- four guide rails

Coding
The coding should be carried out for both modules as described in chapter "2.1 Mounting in carrier and housing ". The coded pin c3 will not be inserted.

Module position

BGT LOG 571
The module position is individually selectable, the VEGALOG 571 processing system adapts automatically through autoconfiguration during the first booting. After autoconfiguration, the slot location of the cards must never be changed.

BGT 596
The module position is individually selectable. Please note that the two connected modules cover a width of 10 TE (5 TE for VEGACOM 557 plus 5 TE for the adapter board VEGACOM 557AP).

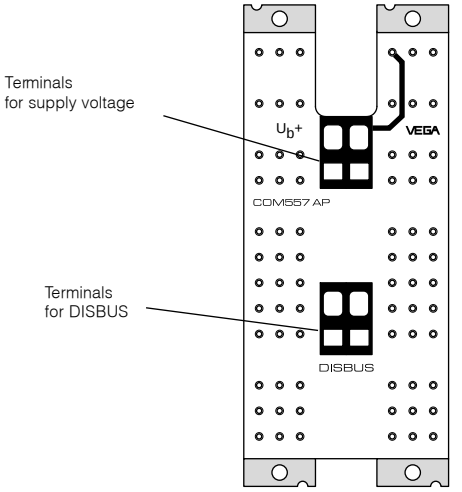
Connection VEGACOM 557AP

BGT LOG 571
With the bus board (part of the carrier BGT LOG 571) connection to LOGBUS is made automatically when inserting VEGACOM 557.

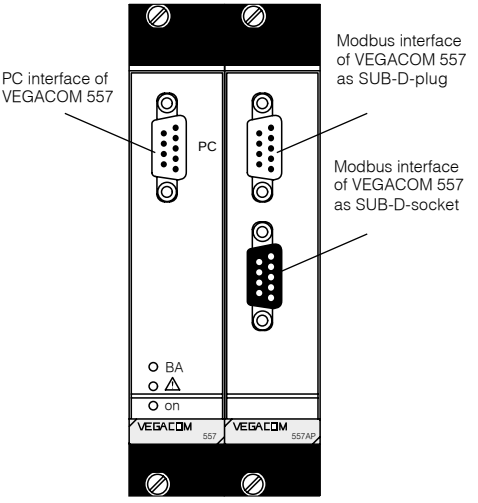
The voltage supply of the card must be provided separately. For this r eason, a 2-pole terminal with tension spring connection, called $U_{b,}$ is available on the back-panel print. The permissible operating voltage of VEGACOM 557 should be observed. In case of DC voltage supply , the corr ect polarity should be noted!

BGT 596
When operating VEGACOM 557 as DISBUS participant, the DISBUS must be wired in addition to the supply voltage.

For the two cables of the DISBUS, a 2-pole terminal with tension spring connection is available. Make sur e that the polarity is cor - rect!



View of back-panel board (rear of the carrier)



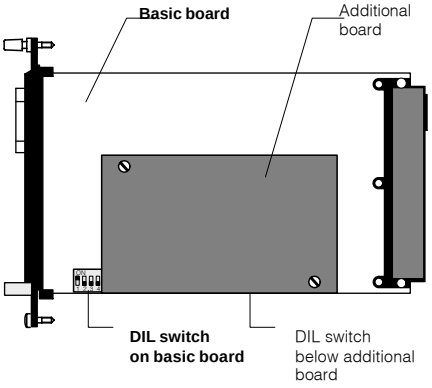
Front view with SUB-D-connections of VEGACOM 557 and VEGACOM 557AP

3 Switch settings on VEGACOM 557

For adjustment of the interfaces or the BUS parameters of the PC interface and the Modbus interfaces, various DIL switches are provided on VEGACOM 557. Before inserting VEGACOM 557 into the carrier or the housing, the DIL switches must be set according to the user-specific data. The data of these settings will be effective with the next initialization (switching on of voltage).

3.1 Adjustment of the PC interface

For adjustment of the RS 232 PC interface in the front panel of VEGACOM 557, a 6-pole DIL switch block is located on the basic board. The PC interface is used for communication between a PC and VEGACOM 557, by means of the adjustment software VVO or the visualisation software VV.



Side view of VEGACOM 557

The following adjustments are carried out via the above mentioned DIL switch block.

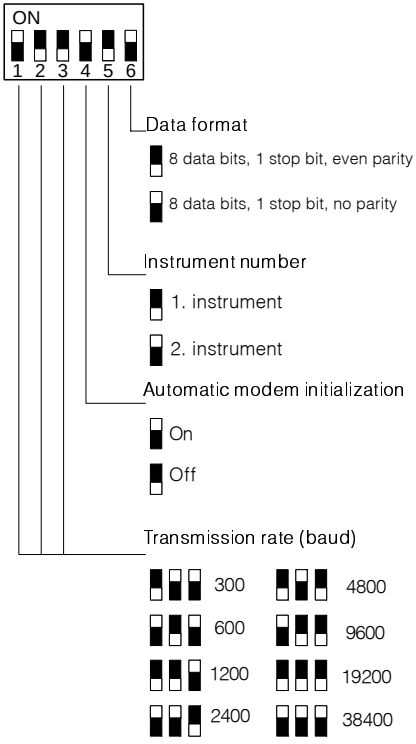
Data format
Parity can be switched from **even** to **no** parity (note for VVO including version 2.15, even parity is compulsory).

Instrument number
Only relevant when operating two VEGACOM 557 on the same DISBUS. If two VEGACOM 557 are operated on the DISBUS, then different instrument numbers have to be assigned.
Not relevant for operation on LOGBUS.

Automatic modem initialization
In position „ON“ the modem will be initialized automatically when connecting it to the VEGACOM interface.

Transmission rate
For VVO or VV , the transmission rate must be set to 9600 baud.

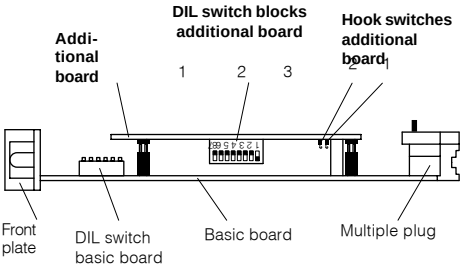
In the following diagram, you see all possible adjustment possibilities for configuration of the PC interface.



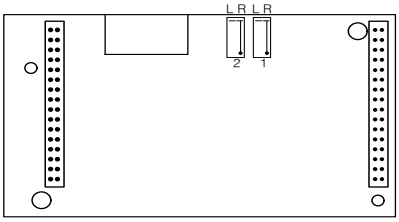
Adjustment possibilities of the DIL switch on the basic board

3.2 Adjustment of the Profibus DP interface

A 8-pole DIL switch block as well as two hook switches for configuration of the Profibus DP interface to the DCS or the PLC are located on the additional board.



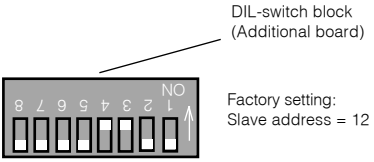
Bottom view of VEGACOM 557



Bottom view of the additional board

DIL switch additional board

The DIL switch is used to select the slave address of VEGACOM 557 on the Profibus DP.



DIL switch block on the additional board for selecting the Slave address

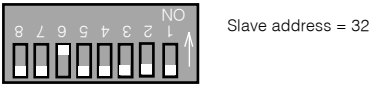
Profibus Slave address of VEGACOM 557

SW 8	SW 7	SW 6	SW 5	SW 4	SW 3	SW 2	SW 1
off	2^6	2^5	2^4	2^3	2^2	2^1	2^0

SW 8 is reserved and must be set to position “off“. Permitted address range 0 … 126.

Example:
Address 32 corresponds:

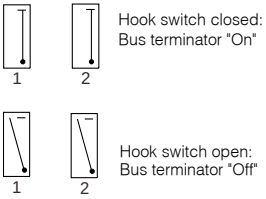
SW 8	SW 7	SW 6	SW 5	SW 4	SW 3	SW 2	SW 1
off	off	on	off	off	off	off	off



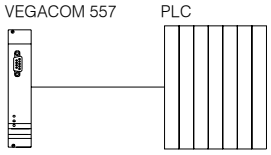
Hook switches additional board

The hook switches are used to switch on the bus terminator resistors.

Switch positions

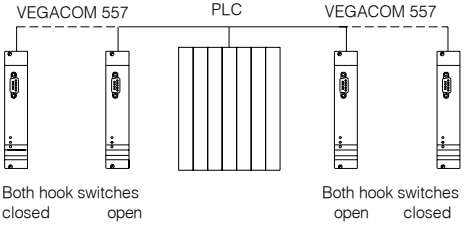


Example 1:



If a VEGACOM 557 is connected to a PLC, both hook switches have to be closed (bus terminator ON).

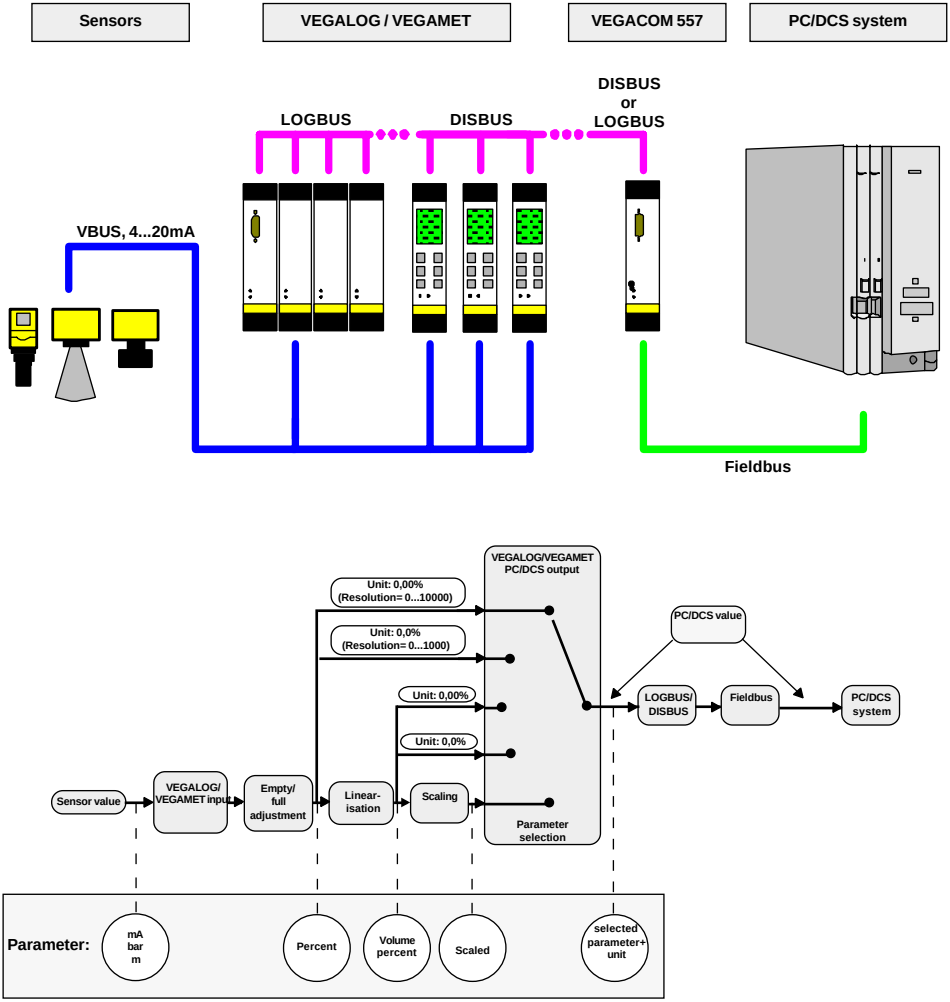
Example 2:



If several VEGACOM 557 are connected to a PLC, both hook switches have to be closed on VEGACOMs located at the beginning and end of the connecting line, and open on VEGACOM 557s located in between.

4 Measurement loop in VEGAMET/VEGALOG

Generally a measurement loop in VEGAMET/VEGALOG processing systems is structured as follows:
A sensor delivers the sensor value to the input of the processing system. This sensor value is then further processing in the processed system (.e.g. empty/full adjustment, linearisation ...). The processed values are outputted (e.g. via current outputs, relay outputs ...). The PC/DCS output is available as gateway for VEGACOM 557, i.e. the processing system transmits the PC/DCS output value via the DISBUS or LOGBUS to VEGACOM 557. This values are accessible to the PC/DCS system via the field bus.



Fundamental configuration of a measurement loop

4.1 PC/DCS output

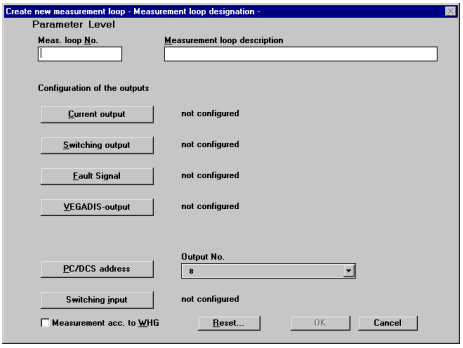
Max. 255 PC/DCS outputs are available, depending on the processing system. The configuration or parameter setting of the PC/DCS outputs is done with the adjustment software VVO or via keyboard (VEGAMET) in the processing system. Several PC/DCS outputs can be allocated to each measurement loop. This enables the possibility of transmitting the measured value, e.g. as “Percentage value“ and “Scaled“, e.g. in “Liters“ to the Pr ofibus master.

Processing system	No. of PC/DCS outputs
VEGAMET 509	3
VEGAMET 512	3
VEGAMET 513	3
VEGAMET 514(V)	3 (7)
VEGAMET 515(V)	7(7)
VEGAMET 614(V)	3(7)
VEGALOG 571	max. 255

Existing PC/DCS outputs

Configuration of the PC/DCS output via VVO

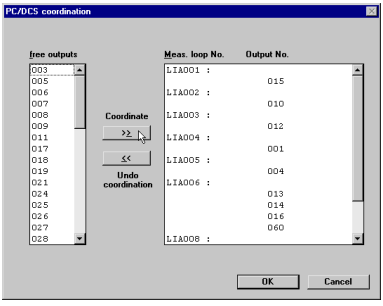
A PC/DCS output is automatically allocated to each measurement loop created in the processing system. As a standard feature, the PC/DCS output number is assigned automatically. The next fr ee PC/DCS output number is always used. If, e.g. the PC/DCS outputs 3, 4, 5 and 6 are still free, the PC/DCS output number 3 is automatically allocated to the new measurement loop. Which output number will be allocated, is shown in VVO during creation of a new measurement loop in the window „Create new measurement loop - Measurement loop designation “. By pushing the button „*PC/DCS address*“, a new window opens in which the allocation of the output number can be carried out manually.



Automatic allocation of a PC/DCS output

It is possible to allocated another or further PC/DCS outputs to a measurement loop later on.

Via the menu items „*Configuration, Measurement loop, Modify*“ and the button “*PC/DCS outputs*“, you reach the window “PC/DCS coordination“.



PC/DCS output coordination

Parameter settings of the PC/DCS output via VVO

The following parameter settings can be made for the PC/DCS output:

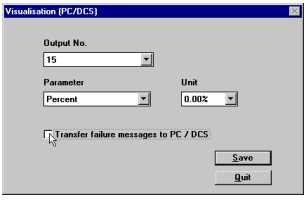
- parameters to be transferred, e.g. percent
- unit in which the parameter should be transferred, e.g. 0.00 %
- transfer error code in the PC/DCS value (from VVO 2.60)
- measured value limitation

Examples of parameter settings: parameter, unit
Percent is chosen as parameter and 0.0% as unit. The measured value 0.0 … 100.0 % is transferred with these parameters as PC/DCS value 0 … 1000.

Percent is chosen as parameter and 0.00% as unit. The measured value 0.00 … 100.00 % is transferred with these parameters as PC/DCS value 0 … 10000.

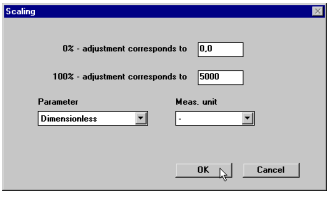
Note
The PC/DCS value is always transferred without decimal point!

The adjustment of the parameter and the unit can be made separately for each PC/DCS output and has no influence on the other outputs of the measurement loop. The parameter settings are done in the window „PC/DCS". This window is reached under VVO via the menu items „*Instrument data, Parameter adjustment,*" choose requested measurement loop, „*Outputs, Display of measured value*," button „*Outputs, Display of measured value and PC/DCS* ".



Parameter setting PC/DCS outputs

Scaled is selected as parameter . The measured value 0 … 100 % shall be transferred to the PC/DCS system as PC/DCS value 10 … 5000. First of all, a scaling must be carried out for the measurement loop. Via the menu items „*Instrument data, Parameter adjustment,*" choose the requested measurement loop, button „*Conditioning and scaling*".



Parameter setting of the scaling

In the window „PC/DCS", „scaled" must be chosen as parameter after the scaling.

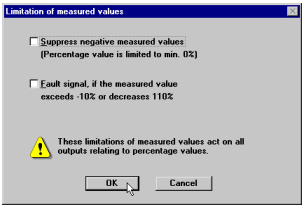
Note
The scaling is used by each output of the measurement loop that applies the parameter „scaled". Modifications in the scaling will then affect all connected indicating instruments!

Transfer error code in the PC/DCS value
From VVO version 2.60, it is possible to transfer an error code if there is interference in a measurement loop. The error code is then transferred in the PC/DCS value instead of the measured value. To have the error code transferred in this way , "Transfer failure messages to PC/DCS " must be activated in the window "PC/DCS".

Adjust limitation of measured values
Further optional parameter settings can be found in the window „Limitation of measured values".
In this window, it is possible to suppress negative measured values, i.e. measured values <0% are limited to 0%.
As another option, measured values <-10 % and >110 % can be outputted as a fault signal.

Note
These options influence all outputs of the measurement loop!

The window can be reached via the following menu items: „*Instrument data, Parameter adjustment,*" select requested measurement loop, button „*Conditioning and Limitation of measured values*".



Limitation of measured values

5 Transfer of measured value

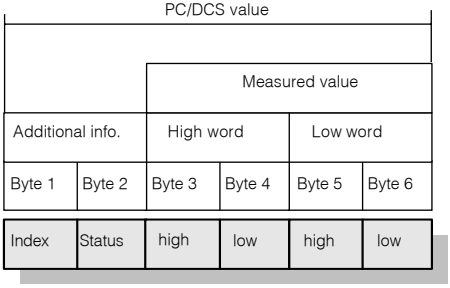
As DP norm slave, the VEGACOM 557 DP gateway is either configured with 50 Byte consistent input data and 2 Byte consistent output data or with 6 Byte consistent input data and 6 Byte consistent output data (see chapter „6 Operating mode VEGACOM 557“). The DP master transmits via the inputs control information to VEGACOM 557, to which VEGACOM 557 r esponds accor dingly, making the data available to the DP master as input information.

5.1 Format for transfer of measured value

Measured values and PC/DCS values
The measured values of the VEGA processing systems (VEGAMET or VEGALOG) connected to VEGACOM 557 are reproduced on the input bytes of the Profibus master as described in chapter 4. They are available in VEGACOM 557 as so-called PC/DCS values. A PC/DCS value consists of 6 Byte.

Structure of a measured value
Measured values of VEGALOG or VEGAMET processing system are transferred to VEGACOM 557 as 2 Byte signed data. This means that the value range comprises max. +32.768 up to -32.767.

Structure of a PC/DCS value
An individual PC/DCS value in VEGACOM 557 consists of 6 Byte and is structured as follows:



The real measured value is in the low word of the measured value and with a length of 2 Byte and signed, this means that the value range is +32768 up to -32767.
The 2 Byte of the high word of the measured value are not used at present - they are filled with the value zero.

In addition to the measured value, VEGACOM 557 provides per DCS value one Byte for the PC/DCS index and another Byte for information on the current measured value status.

The PC/DCS output number is transferred in the byte index. The status describes the conditions of the respective measured value. The contents of the measured value is only valid if the respective status has the value zero.

If the status value is not equal to zero, the status value and the respective value in the measured value field must be taken into account for a detailed error diagnosis. The following list explains the possible errors:

Status	Meas. value	Meaning
0x00	0xXXXX	valid measured value
0x01	0xXXXX	simulated meas. value (only on VEGAMET 509 and 512)
0x80	0xXXXX	old meas. value (probably connection separated)
0xFE	0x0000	there is no meas. value available (not configured)
0xFF	0xFFFF	there is no VEGAMET or VEGALOG connected
0xFF	0x00XX	failure message of an individual meas. loop
		XX = error type
0xFF	0x8000	failure message of an individual meas. loop Error type not defined

6 Operating mode VEGACOM 557

Two different operating modes are available for VEGACOM 557.
Depending on the operating mode, VEGACOM 557 reserves a different number of input and output bytes in the Profibus-Master.

6.1 Mode 50E2A

In this mode, VEGACOM 557 reserves 50 input bytes and 2 output bytes.
The Profibus-Master has to process 50 Bytes of data consistently.

How it works
A control command and a block number (1 byte each) are written into the 2 Byte output data. After VEGACOM 557 has received these two Bytes via Profibus DP, it answers by sending the data of the required block - these 50 Byte are then available to the Profibus-Master as input bytes.
Since a maximum of 255 PC/DCS values and up to 32 relay status are available in VEGACOM, but only 50 bytes at a time can be transferred on the Profibus, the data are multiplexed on the bus.

To facilitate this, the data are divided in VEGACOM 557 into blocks. The requested block can be enquired by the Profibus-Master with the control command and the block number.
8 PC/DCS values (6 Byte each), the control command (1 Byte) and the block number (1 Byte) decremented by the value 1 are returned in a block.

6.2 Mode 6E6A

In this mode, VEGACOM 557 reserves 6 input byte and 6 output byte.
The Profibus-Master must process 6 Byte data consistently.

How it works
A control command and a PC/DCS value number (1 Byte each) is written by the Profibus-Master into the 6 Byte output data, the remaining 4 Byte must be filled with the value 0xFF.

After VEGACOM 557 has received these 6 Byte via the Profibus DP, it answers by sending the data of the enquired PC/DCS value. These 6 Byte are then available as input bytes to the Profibus-Master.

Since a maximum of 255 PC/DCS values and up to 32 relay status are available in VEGACOM, but only 6 bytes at a time can be transferred on the Profibus, the data on the bus are multiplexed.

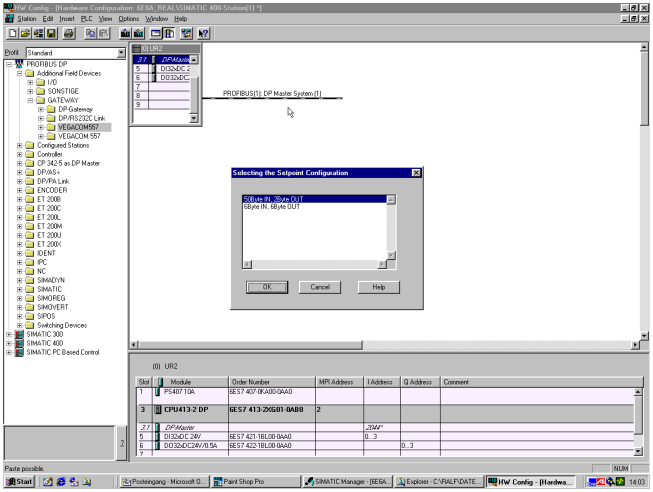
To facilitate this, the data in VEGACOM 557 are divided into single PC/DCS values. With the control command and the PC/DCS value number, the Profibus-Master can enquire the respective PC/DCS value.

6.3 Selection of the operating mode

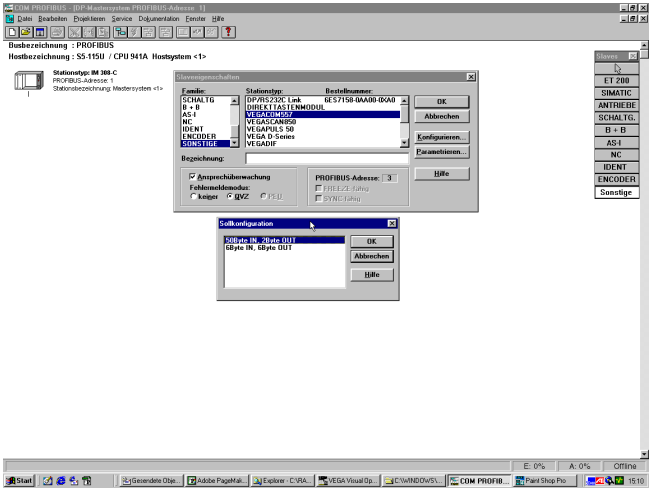
To select the operating mode, it is necessary, to choose the respective configuration when creating the bus configuration. The GSD file provides both operating modes as options.

The selection is made with the respective configuration tool, e.g. HW-Config for SIEMENS S7 systems or COM PROFIBUS for SIEMENS S5 systems.

Depending on the configuration tool, a window is opened in which the desired operating mode can be selected when adding a VEGACOM 557 slave to the bus configuration.



Selection of the operating mode in HW-Config of the Simatic-Manager for S7 systems



Selection of the operating mode in COM PROFIBUS for SIEMENS S5 systems

7 Data image in VEGACOM 557

VEGACOM 557 collects the measured values of the VEGA signal conditioning instruments VEGAMET series 500 and 600 (via DISBUS) or VEGALOG 571 (via LOGBUS) and puts them in the temporary memory for collection via the Profibus DP. The method of storing the measured values (for the higher -priority processing system) in the VEGACOM 557 temporary memory differs depending on the selected configuration. It depends on whether VEGACOM 557 is connected to the DISBUS or the LOGBUS, and if DISBUS, also on the connected instrument type. The allocation can, however, also be influenced via appropriate inquiry protocols.

Note
On the VEGAMET 513, 514, 515 and series 600 signal conditioning instruments, as well as on the VEGALOG 571 processing system, the individual configuration of the PC/DCS outputs with the adjustment software VVO is possible (see chapter "4 Measurement loop in VEGAMET/VEGALOG").

On VEGAMET 513, 514, 515 and series 600 signal conditioning instruments as well as the VEGALOG 571 processing system, it is additionally possible to enquire the conditions of the contact inputs/ and outputs via VEGACOM 557.

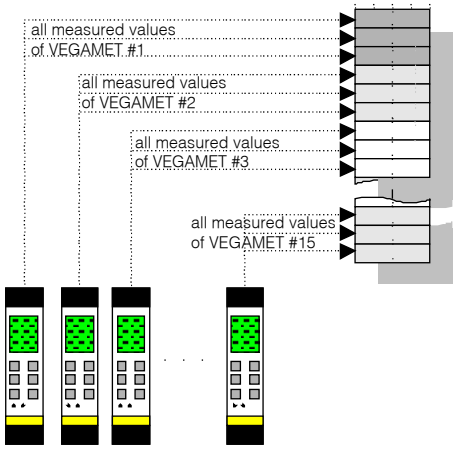
7.1 Image of measured value when connecting to DISBUS

UP to 15 bus participants (VEGAMET) can be connected to the DISBUS, whereby each participant delivers max. 7 PC/DCS values. The bus addresses 1 … 15 are configured on the VEGAMET instruments, bus address 0 is not permitted. As already mentioned, the storage of the measured values for the VEGAMET signal conditioning instruments can be influenced by the user . For this, the operating mode of VEGACOM 557 and the enquiry telegram (control command) of the Profibus-Master are decisive.

Image of measured value DISBUS in mode 50E2A

In this operating mode of VEGACOM 557, the PC/DCS values are allocated as blocks relating to the VEGAMET bus address and the PC/DCS output number .
A memory area of 16 PC/DCS values is reserved for each VEGAMET . The allocation of the individual PC/DCS values in blocks also depends on the enquiry telegram (control command) of the Profibus-Master. There are two control commands to which the VEGACOM 557 reacts. The two control commands 0xCC or 0xCB are described in detail in the following.

Control command 0xCC (DISBUS)
In case of an enquiry with this control command, the PC/DCS values will be grouped in ascending sequence acc. to the VEGAMET addresses.



Grouping of measured values acc. to VEGAMET addresses (here VEGAMET 513)

In total, there are 32 blocks with 8 PC/DCS values each.

Enquiry of measured value from the DP Master with control command 0xCC to DISBUS
In the 2 Byte output section of the VEGACOM 557 DP-Gateway , the DP Master enquir es with the control command 0xCC and a block no. 1 … 32, one block with eight measured values each fr om the DP-Gateway .

DP-Master: Control command: 0xCC
Block no.: 0x01...0x20

2 Byte output section	
Byte 1	Byte 2
control command	Block no.
0xCC	0x01 ...0x20

Example:
Enquiry telegram to VEGACOM 557 (2 Byte):

0xCC	0x03
control word	Block no. 3 is enquired

Answering telegram of VEGACOM 557 (50Byte):

0xCC	0x02	0x11	0xYY	0x00	0x00	0xHH	0xLL	0x12	0xYY	0x00	0x00	0xHH	...
control word		PC/DCS value no. 1, VEGAMET no. 1						PC/DCS value-no. 2, VEGAMET no. 1					

0xYY = Index-Byte
0xHH = High-Byte measured value
0xLL = Low-Byte measured value

Enquiry of measured value from Profibus-Master

Image of measured value on Profibus DP with control command 0xCC on DISBUS
VEGACOM 557 answers with the block no. (0 … 31) decremented by the value 1

		8 PC/DCS values									
Control word		PC/DCS value no. 1 of VEGAMET no.1						PC/DCS value no. 2...7			
Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9	Byte10	···	Byte50
Control	Block no.	Index	Status	High-HI	High-LO	Low-HI	Low-LO	Index	Status	···	Low_LO
0xCC	0x02	0x11	0x00	0x00	0x00	0xXX	0xXX	0x12	0x00	···	0xXX

Answer of VEGACOM 557 to the enquiry of measured value from the Profibus-Master (here enquired block no. = 3)

Note:
The index delivered via the DISBUS on enquiry of measured value, is structured as follows:

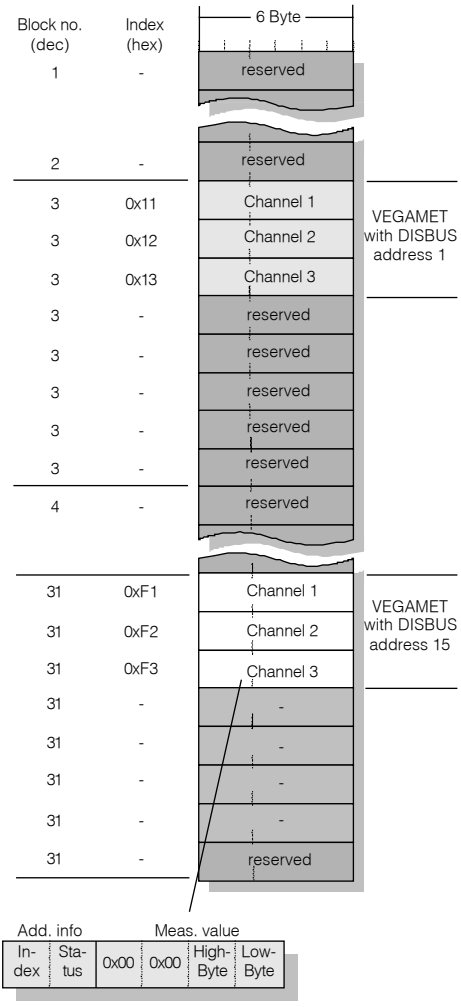
Index byte	
BIT 4...7	BIT 0...3
VEGAMET address	PC/DCS number
1...15	1...7

Example:
If the enquired measured value is the PC/DCS value no. 3 of VEGAMET no. 2, the value 0x23 (hex) is delivered in the index byte.

Structure of the index byte on enquiry of measured value via DISBUS

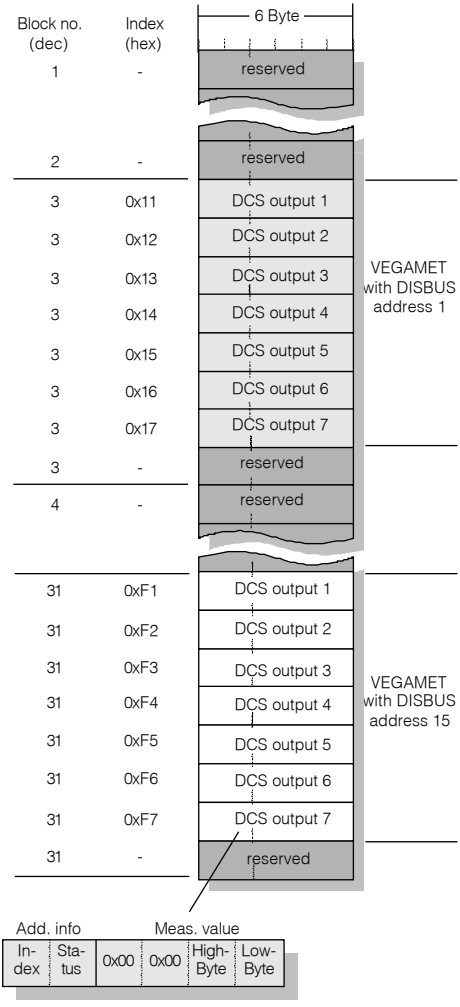
Image of measured value when connecting to DISBUS with grouping acc. to VEGAMET address (control command 0xCC)

Case 1:
Only instruments of VEGAMET 509 or 512 are connected.



Grouping of measured values acc. to VEGAMET addresses on VEGAMET 509 or 512

Case 2:
Only instruments of VEGAMET 513, 514, 515 or series 600 are connected.

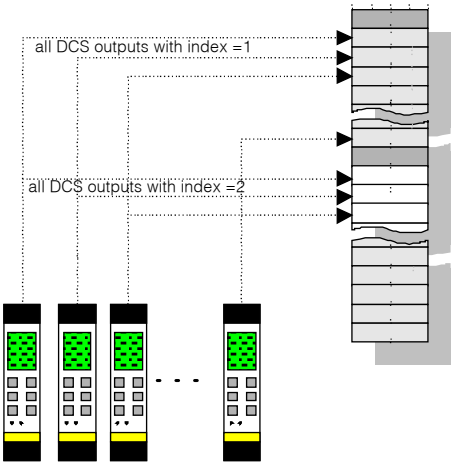


Grouping of measured values acc. to VEGAMET addresses on VEGAMET 513, 514, 515 or series 600

Note:
A complete overview of the measured value image of VEGACOM 557 is given in supplement A at the end of this manual.

Control command 0xCB (DISBUS)

In case of an enquiry with this control command, the measured values are grouped acc. to DCS indices or channels.

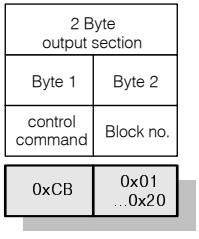


Grouping of measured values acc. to DCS indices or channels

The division of the individual PC/DCS values into blocks is shown in the following figures. There are a total of 32 blocks with 8 PC/DCS values each.

The enquiry is made as described before, the only exception is that 0xCC is not used as control command, but 0xCB. With this type of enquir y, you will initially r eceive the first PC/DCS output of all VEGAMET connected to the DISBUS, then the second PC/DCS output etc. The advantage is, that with 2 block enquiries you will receive the PC/DCS output of all 15 VEGAMET, whereas with the contr ol command 0xCC, 31 block enquiries ar e necessar y.

DP-Master Control command: 0xCB
Block no.: 0x01...0x20



Example:
Enquiry telegram to VEGACOM 557 (2 Byte):

0xCB	0x01	Block no. 1 is enquired

Answering telegram of VEGACOM 557 (50Byte):

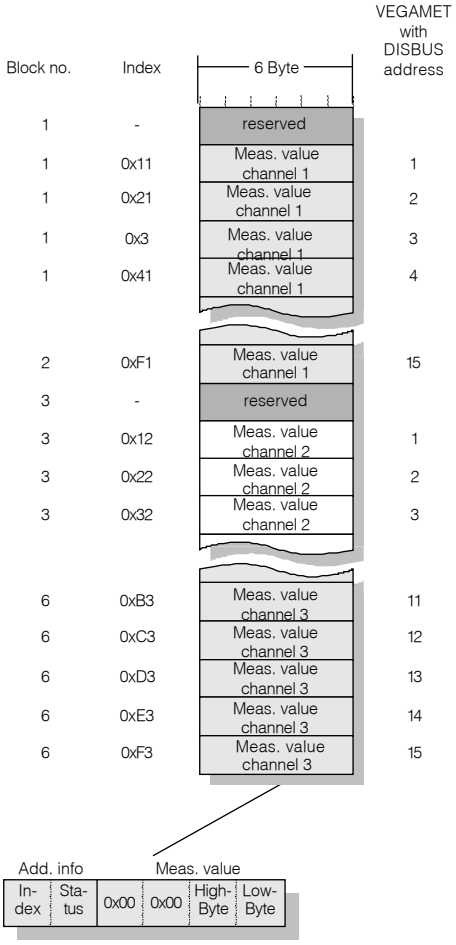
0xCB	0x00	0x01	0xFE	0x00	0x00	0x00	0x00	0x11	0xYY	0x00	0x00	0xHH	...
Control word					Reserved				PC/DCS value no. 1, VEGAMET no. 1				

0xYY = Index-Byte
0xHH = High-Byte measured value
0xLL = Low-Byte measured value

Enquiry of measured value from the Profibus-Master

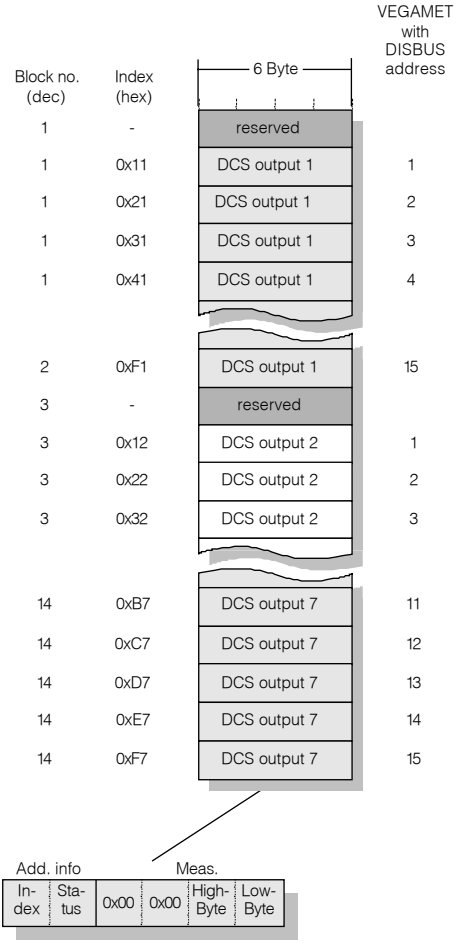
Image of measured value when connecting to DISBUS with grouping acc. to PC/DCS indices (control command 0xCB)

Case 1:
There are only instruments of type VEGAMET 509 or 512 connected.



Grouping of measured value acc. to PC/DCS indices on VEGAMET 509 or 512

Case 2:
There are only instruments of type VEGAMET 513, 514, 515 or series 600 connected.



Grouping of measured value acc. to PC/DCS indices on VEGAMET 513, 514, 515 or series 600

Note:
A complete overview of the measured value image of VEGACOM 557 is given in supplement A at the end of this manual.

Image of the contact inputs/outputs on the DISBUS in mode 50E2A

Beside the previously described measured values, it is possible to transmit via the VEGACOM 557 also switching conditions of the VEGA signal conditioning instruments VEGAMET 513, 514, 515 and series 600.

These are:
- condition of the contact inputs (position of key switch etc.)
- condition of the contact outputs (relay outputs)

In contrast to the image of the measured values, the image of the switching conditions is "Bit orientated". One switch condition is represented in the VEGACOM 557 as one Bit, whereby all available information of a VEGAMET is saved within one data word of 16 Bit (= 2 Byte). Such a data word with 16 Bit, i.e. max. 15 data words at 16 Bit each, is available for each VEGAMET on the DISBUS (bus addresses 1...15). The filing of the contact input/outputs is made in block no. 33 of the VEGACOM 557 memory area. The allocation of the individual data words is made acc. to the DISBUS addresses.

On the DISBUS a difference is made in the data word between input contacts (EK) and relay contacts (RK). The input contacts are bit coded in the High-Byte, the relay contact in the Low-Byte of the data word (see fig. 7.11).

Example:
Enquiry telegram to VEGACOM 557 (2 Byte):

0xCC	0x21	Block no. 33 (contact input block/output block) is enquired

Answering telegram of VEGACOM 557 (50Byte):

0xCC	0x20	0x80	0x80	0xEE	0xRR	0xEE	0xRR	0xEE	0xRR	0xEE	0xRR	0xEE	0xRR	...
Control word		reserved		VEGAMET 1		VEGAMET 2		VEGAMET 3		VEGAMET 4		VEGAMET 5		

Data word															
input contacts (0xEE)								output contacts (0xRR)							
Byte1 (High-Byte)								Byte2 (Low-Byte)							
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Status	res.	res.	res.	res.	res.	EK2	EK1	Status	res.	res.	res.	res	RK3	RK2	RK1
0/1	0	0	0	0	0	0/1	0/1	0/1	0	0	0	0	0/1	0/1	0/1

Format of the contact inputs/outputs on the DISBUS

The meaning of the individual Bits is defined as follows:

Status of the inputs:
0 = all inputs OK
1 = input status not available (no inputs configured or VEGAMET not available)

Switching conditions of inputs 1 and 2:
0 = input contact is open
1 = input contact is closed

Status of the outputs:
0 = all outputs OK
1 = output status not available (no outputs configured or VEGAMET not available)

Switching conditions of outputs 1, 2 and 3 (output 3 corresponds to fail safe relay):
0 = relay is deenergised
1 = relay is energised

Allocation of the contact inputs/outputs in VEGACOM 557 to block no.33

Block no.	VEGAMET with DISBUS address	2Byte	
33	-	-	-
33	1	EK	RK
33	2	EK	RK
33	3	EK	RK
33	4	EK	RK
33	5	EK	RK
33	6	EK	RK
33	7	EK	RK
33	8	EK	RK
33	9	EK	RK
33	10	EK	RK
33	11	EK	RK
33	12	EK	RK
33	13	EK	RK
33	14	EK	RK
33	15	EK	RK

Addressing of the contact inputs/outputs in VEGACOM 557 on VEGAMET 513, 514, 515 or series 600

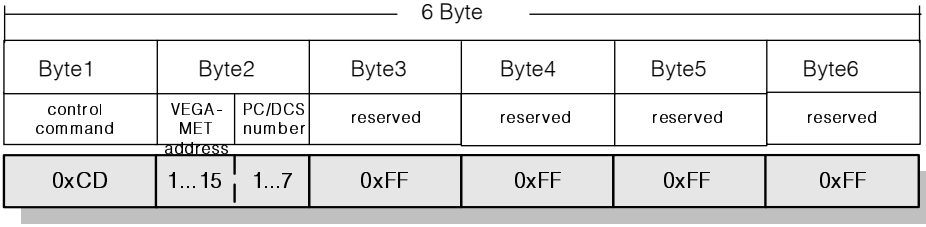
Note:
A complete overview of the process image of the switching status of VEGACOM 557 is given in supplement B at the end of this manual.

Measured value image DISBUS in mode 6E6A

In this operating mode, it is possible to read out the PC/DCS values individually in VEGACOM 557, i.e. the Profibus-Master enquires a measured value and this measured value is provided by the VEGACOM 557.

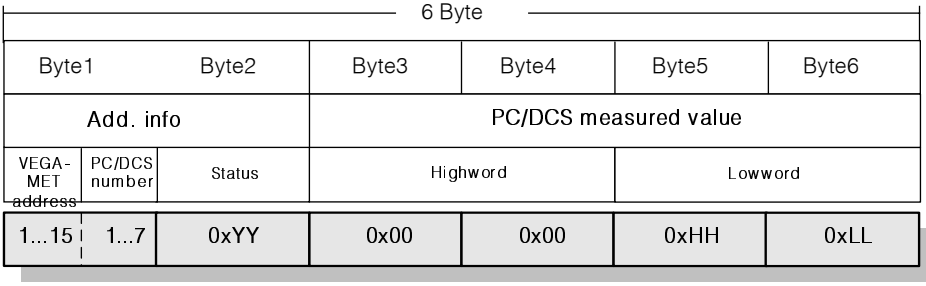
Control command 0xCD (DISBUS)

When enquiring with this control command, VEGACOM 557 answers with individual PC/DCS value. The enquiry telegram written by the Profibus-Master into the 6 Byte outputs is structured as follows.



Format of the enquiry acc. to individual PC/DCS values

VEGACOM 557 writes the following answering telegram into the 6 Byte inputs of the Profibus-Master:



Format of the VEGACOM 557 answer

Status:

0x00 = valid measured value
0x01 = simulated measured value (only on VEGAMET 509 and 512)
0x80 = old measured value (probably connection separated)
0xFE = no PC/DCS value available (not configurated)
0xFF = general error

PC/DCS measured values

0xHH = High-Byte of the measured value
0xLL = Low-Byte of the measured value

Value range comprises max. +32.768 to -32.767.

Image of the contact inputs/outputs on DISBUS in mode 6E6A

Beside the previously described individual PC/DCS measured values, also switching conditions of the individual VEGA signal conditioning instruments VEGAMET 513, 514, 515 and series 600 measured values can be transmitted via VEGACOM 557.

These are:
- status of the contact inputs (position of the key switch etc.)
- status of the contact outputs (relay or transistor outputs)

Control command 0xCE (DISBUS)
In contrast to the image of the measured values, the image of the switching conditions is „Bit orientated". One switch condition is represented in the VEGACOM 557 as one Bit, whereby all available information of a VEGAMET is saved within one data word of 16 Bit (= 2 Byte). Such a data word with 16 Bit, i.e. max. 15 data words at 16 bit each, is available for each VEGAMET on the DISBUS (bus addresses 1...15). With the control command 0xCE the switching status of two VEGAMET can be r ead out per enquir y, i.e. two data wor ds.

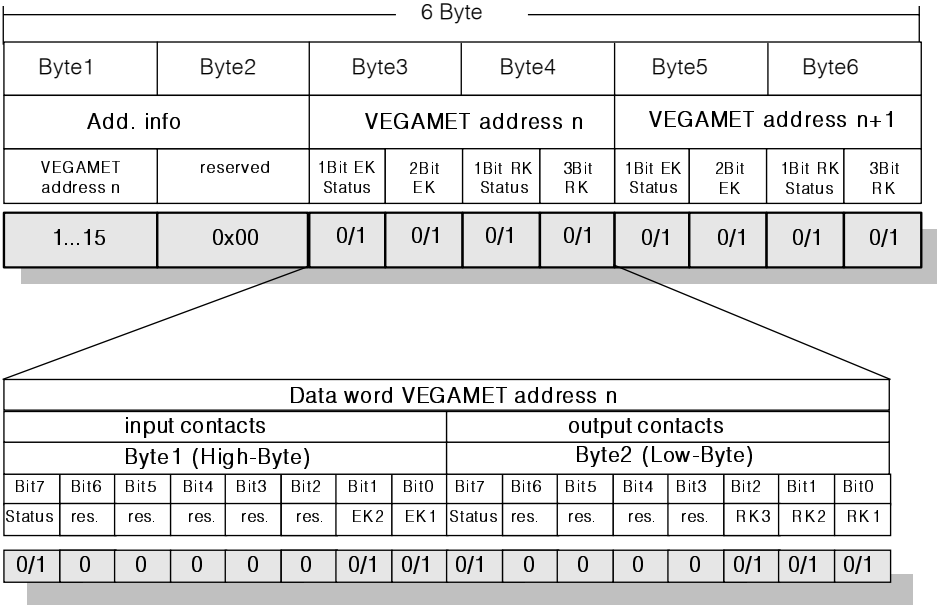
The enquiry telegram, written by the Profibus-Master into the 6 Byte outputs, is structured as follows.

6 Byte

Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
control command	VEGAMET address	reserved	reserved	reserved	reserved
0xCE	1...15	0xFF	0xFF	0xFF	0xFF

Format of the enquiry acc. to contact inputs/outputs (DISBUS)

VEGACOM 557 writes the answering telegram (show on the following page) into the 6 Byte inputs of the Pr ofibus-Master. The DISBUS dif ferentiates in the data wor d between input contacts (EK) and relay contacts (RK). The input contacts are bit coded in the High-Byte, the relay contacts in the Low-Byte of the data word.



Format of the contact inputs/outputs on DISBUS

The meaning of the individual bits is defined as follows:

Status of the inputs (EK):
0 = all inputs OK
1 = input status not available (no inputs configured or VEGAMET not available)

Switching status of the inputs (EK) 1 and 2:
0 = Input contact is open
1 = Input contact is closed

Status of the outputs (RK):
0 = all outputs OK
1 = outputs status not available (no outputs configured or VEGAMET not available)

Switching status of the outputs (RK) 1, 2 and 3 (output 3 corresponds to fail safe relay):
0 = Relay is deenergised
1 = Relay is energised

7.2 Measured value image when connecting to LOGBUS

VEGALOG 571 can manage up to 255 measurement loops. For the transmission of the measured values of a measurement loop, VEGALOG provides up to 255 PC/DCS outputs. One or several PC/DCS outputs with individual index can be allocated to each measurement loop. The configuration of VEGALOG 571 is made with the VEGA adjustment software VVO (see chapter 4)

Image of measured value LOGBUS in mode 50E2A

In this operating mode, the PC/DCS values are reproduced in VEGACOM 557 in blocks dependent on the PC/DCS output number .

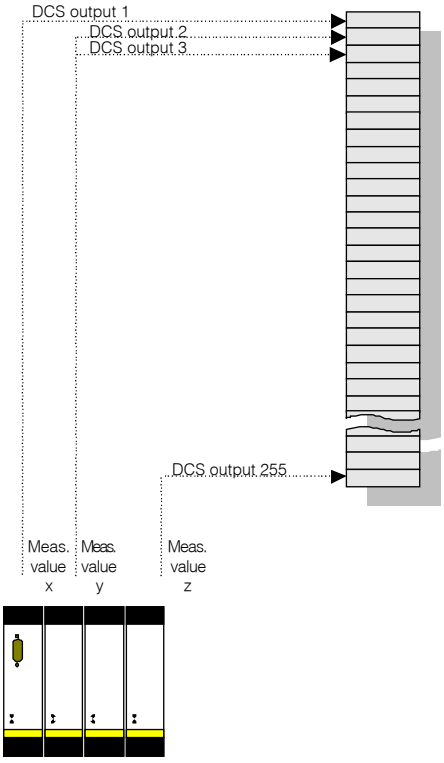


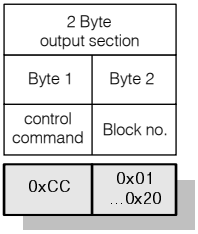
Image of measured values when connecting to VEGALOG 571

The allocation of the individual PC/DCS values in blocks is shown in a diagram. The Profibus-Master has to send a control command to VEGACOM 557 to read the measured values out of VEGACOM 557.

Control command 0xCC (LOGBUS):
In case of an enquiry with this control command, the PC/DCS values are grouped in ascending sequence acc. to the PC/DCS output number. The measur ed value image when connecting to LOGBUS is always generated with a sorting acc. to the PC/DCS output number.

Enquiry of measured values:

DP-Master: Control command: 0xCC
Block no.: 0x01...0x20



Enquiry of measured value from Profibus-Master

Example:
Enquiry telegram to VEGACOM 557 (2 Byte):

| 0xCC | 0x01 | Block no. 1 is enquired

Answering telegram of VEGACOM 557 (50 Byte):

| 0xCC | 0x00 | 0x01 | 0xYY | 0x00 | 0x00 | 0xHH | 0xLL | 0x02 | 0xYY | 0x00 | 0x00 | 0xHH | ...
| Control word | PC/DCS value-no. 1 | PC/DCS value-no. 2

0xYY = Index-Byte
0xHH = High-Byte measured value
0xLL = Low-Byte measured value

Block no.	PC/DCS outputs-no.
1	1...8
2	9...16
3	17...24
4	25...32
5	33...40
6	41...48
7	49...56
8	57...64
9	65...72
10	73...80
11	81...88
12	89...96
13	97...104
14	105...112
15	113...120
16	121...128
17	129...136
18	137...144
19	145...152
20	153...160
21	161...168
22	169...176
23	177...184
24	185...192
25	193...200
26	201...208
27	209...216
28	217...224
29	225...232
30	233...240
31	241...248
32	249...255

Grouping of measured values acc. to PC/DCS output number on LOGBUS

Image of the contact outputs on LOGBUS

Beside the previously described measured values, also the switching status of the VEGA processing system VEGALOG 571 can be transmitted via VEGACOM 557.

These are:
- status of the contact outputs of the AR cards (relay contacts)
- status of the contact outputs of the A T cards (transistor outputs)

In contrast to the image of measured values, the image of switching status is „Bit orientated". In VEGACOM 557 a switching status is represented by one Bit, whereby all available information of a VEGALOG 571 output car d (AR or AT) is saved in one data wor d of 16 Bits (= 2 Byte). A data wor d of 16 bit exists for each output (AR / A T) on the LOGBUS (module 1...32), i.e. max. 32 data words at 16 bit each. The contact outputs are saved in block no. 33 and 34 of the VEGACOM 557 memory area. The allocation of the individual data words is made acc. to module numbers.

A VEGALOG ouput car d (AR/AT) has max. 10 output contacts (RK), which ar e bit coded in one data word (2 Byte). If the respective Bit is 1, the output contact is closed, if the respective Bit is 0, the output contact is open. The most significant bit of the data word contains the status information. If the status bit is 0, the output information is valid, if the status bit is 1, the output information is invalid.

Data word															
output contacts															
Byte1 (High-Byte)								Byte2 (Low-Byte)							
Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Status	res.	res.	res.	res.	res.	RK10	RK9	RK8	RK7	RK6	RK5	RK4	RK3	RK2	RK1
0/1	0	0	0	0	0	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1

Format of the contact outputs on the LOGBUS

The meaning of the individual bits is defined as follows:

Status of the outputs:
0 = all outputs OK
1 = output status not available (no outputs configured or output card not available)

Switching status of the outputs 1 … 10:
0 = contact is open
1 = contact is closed

Allocation of the contact outputs in VEGACOM 557 to block no. 33 and 34

Block no.	Output card with module number	2Byte
33	1	RK
33	2	RK
33	3	RK
33	4	RK
33	5	RK
33	6	RK
33	7	RK
33	8	RK
33	9	RK
33	10	RK
33	11	RK
33	12	RK
33	13	RK
33	14	RK
33	15	RK
33	16	RK
34	17	RK
34	18	RK
34	19	RK
34	20	RK
34	21	RK
34	22	RK
34	23	RK
34	24	RK
34	25	RK
34	26	RK
34	27	RK
34	28	RK
34	29	RK
34	30	RK
34	31	RK
34	32	RK

Note:
A complete overview of the process image of the VEGACOM 557 measured values is given in supplement B at the end of this manual.

Addressing of the contact outputs in VEGACOM 557 with VEGALOG 571

Measured value image LOGBUS in mode 6E6A

In this operating mode, the PC/DCS values can be read out individually in VEGACOM 557, i.e. the Profibus-Master enquires a measured value and the VEGACOM 557 delivers this measured value.

Control command 0xCD (LOGBUS)

When enquiring with this control command, VEGACOM 557 answers with an individual PC/DCS value. The enquiry telegram, written by the Profibus-Master into the 6 Byte outputs is structured as follows:

6 Byte					
Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
control command	PC/DCS number	reserved	reserved	reserved	reserved
0xCD	1...255	0xFF	0xFF	0xFF	0xFF

Format of the enquiry acc. to individual PC/DCS values

VEGACOM 557 writes the following answering telegram into the 6 Byte input of the Profibus-Master:

6 Byte					
Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
Add. info		PC/DCS measured value			
PC/DCS number	Status	Highword		Lowword	
1...255	0xYY	0x00	0x00	0xHH	0xLL

Format of the VEGACOM 557 answer

Status:

0x00 = valid measured value
0x01 = simulated measured value (only on VEGAMET 509 and 512)
0x80 = old measured value (probably connection separated)
0xFE = no PC/DCS value available (not configured)
0xFF = general error

PC/DCS measured value

0xHH = High-Byte of the measured value
0xLL = Low-Byte of the measured value

Value section comprises max. +32.768 to -32.767.

Image of the contact outputs on LOGBUS in mode 6E6A

Beside the previously described individual PC/DCS values, also the switching status of the VEGA processing system VEGALOG 571 can be transmitted via VEGACOM 557.

These are:
- status of the contact outputs of the AR cards (relay contacts)
- status of the contact outputs of the AT cards (transistor outputs)

Control command 0xCE (LOGBUS)
In contrast to the image of measured values, the image of switching status is „Bit orientated". In VEGACOM 557 a switching status is represented by one Bit, whereby all available information of a VEGALOG 571 output card (AR or AT) is saved in one data word of 16 Bits (= 2 Byte). A data word of 16 bit exists for each output (AR / AT) on the LOGBUS (module 1...32), i.e. max. 32 data words at 16 bit each.

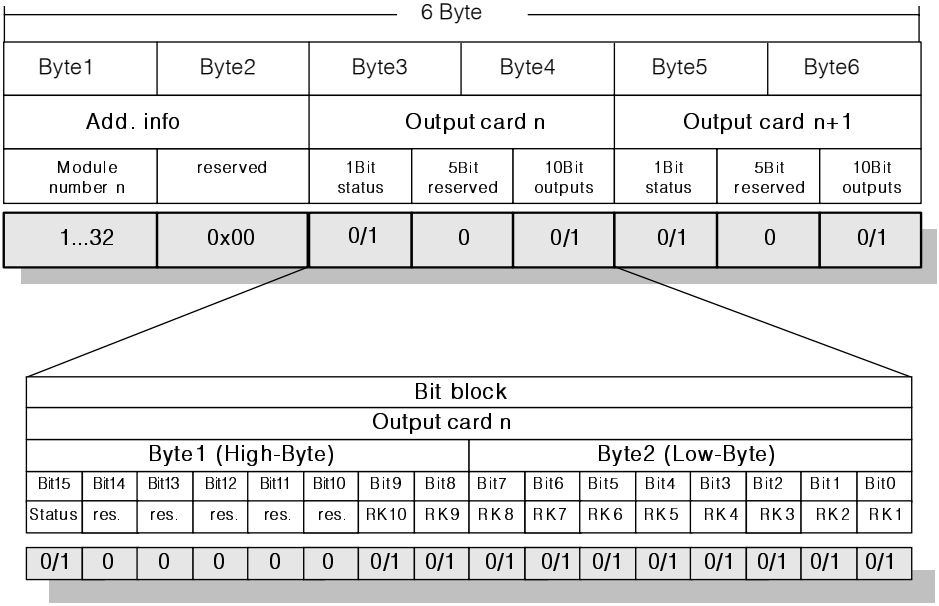
A VEGALOG ouput card (AR/AT) has max. 10 output contacts (RK), which are bit coded in one data word (2 Byte). If the respective Bit is 1, the output contact is closed, if the respective Bit is 0, the output contact is open. The most significant bit of the data word contains the status information. If the status bit is 0, the output information is valid, if the status bit is 1, the output information is invalid.
With control command 0xCE, the switching status of two VEGALOG output cards can be read out per enquiry.

The enquiry telegram, written by the Profibus-Master into the 6 Byte outputs, is structured as follows:

6 Byte					
Byte1	Byte2	Byte3	Byte4	Byte5	Byte6
control command	module number	reserved	reserved	reserved	reserved
0xCE	1...32	0xFF	0xFF	0xFF	0xFF

Format of the enquiry acc. to contact outputs (LOGBUS)

VEGACOM 557 writes the answering telegram shown on the next page into the 6 Byte inputs of the Profibus-Master.



Format of the answering telegram for contact outputs on LOGBUS

The meaning of the individual bits is defined as follows:

Status of the outputs:
0 = all outputs OK
1 = output status not available (no outputs configured or VEGAMET not available)

Switching condition of the outputs 1, 2 and 3 (output 3 corresponds to fail safe relay):
0 = relay is deenergised
1 = relay is energised

7.3 Overview of the operating modes and control commands

In the table below, you will find all operating modes and contr ol commands which ar e available with VEGACOM 557.

Processing system	Operating mode	Control command	Description
VEGAMET (DISBUS)	50E2A	0xCC	Block enquiry PC/DCS values + contact inputs/outputs (grouped acc. to VEGAMET addresses)
		0xCB	Block enquiry PC/DCS values + contact inputs/outputs (grouped acc. to PC/DCS indices)
	6E6A	0xCD	Individual enquiry PC/DCS values
		0xCE	Individual enquiry contact inputs/outputs
VEGALOG (LOGBUS)	50E2A	0xCC	Block enquiry PC/DCS values + contact inputs/outputs
	6E6A	0xCD	Individual enquiry PC/DCS values
		0xCE	Individual enquiry contact inputs/outputs

8 Setup

8.1 Setup check list

For the setup of VEGACOM 557 on PROFIBUS DP proceed as follows:

I. Check hardware requirements
- PROFIBUS DP compatible master compo nent
- VEGACOM 557 version „Profibus DP“

II. Check software requirements
- VEGA Utility diskette from version 3.00 with GSD file and programming examples for Siemens S5, S7

II. Carry out adjustments on VEGACOM 557 (DIL switch on additional board)
- Set Profibus-Slave address
- Activate/deactivate bus terminator

III. Configurate Profibus DP-Master and check communication
- The green LED named “BA” lights on VEGACOM 557 with correct communication.

8.2 Setup SIEMENS S7 automation system

For connection of decentralised peripherals to automation instruments of S7 series, SIEMENS uses Pr ofibus DP. Many of the S7 CPUs offer already a Profibus DP interface. For connection of VEGACOM 557 to a S7 automation system, a Profibus DP interface must be available and the automation system must work as Pr ofibus-Master. In this section, all measures that must be taken for the setup of your VEGACOM 557 on a S7 automation system are described in detail.

Note:
If your Profibus-Master is manufactured by another company, please check the manufacturer documentation for the r equired information.

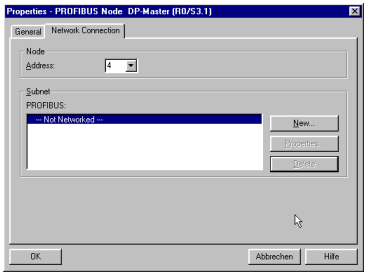
Configuration SIEMENS S7 automation system

The configuration and parameter setting of the Profibus is done with the software SIMATIC-Manager fr om SIEMENS. All configurations for the connected Profibus network are made via the window HW-Config.

Integration of the GSD file
The GSD file of VEGACOM 557 must be integrated so that the VEGACOM 557 appears in the instrument catalogue of HW-Config. The properties of VEGACOM 557 (e.g. possible baud rates) are described in the GSD file. The GSD file is called „_COMb208.GSD“ and is included on the supplied utility diskette, in addition there are bitmap files for VEGACOM 557. Proceed as follows to integrate the GSD file:

In the window HW Config you have to choose under the menu item „Extras“ -> „Install new GSD...“ the GSD file „_COMb208.GSD“. By pushing the button „Open“, VEGACOM 557 is integrated in the instrument catalogue. The bitmaps are installed automatically, if they are in the same the directory as the GSD file.

Plan Master/Host system
As a first step, the complete connected S7 hardware (carrier, power supply unit, CPU, I/O etc.) must be planned. After a CPU or a communication processor with DP interface has been added, a Profibus network must be created now. Under „Properties“ -> button „PROFIBUS“ of the DP master , a new Profibus network will be created with the button „New“.



Create new Profibus network

After a Profibus network has been created, the baud rate and the bus parameters for the Profibus network can be chosen via the button „Properties“ and „Network adjustments“.

Plan Profibus-Slave VEGACOM 557
In the instrument catalogue of the window HW Config you must choose under „Profibus DP“ -> „Additional field devices“ -> „GATEWAY“ VEGACOM 557. With Drag & Drop VEGACOM 557 can be now allocated to a Profibus network. The following steps have to be carried out:

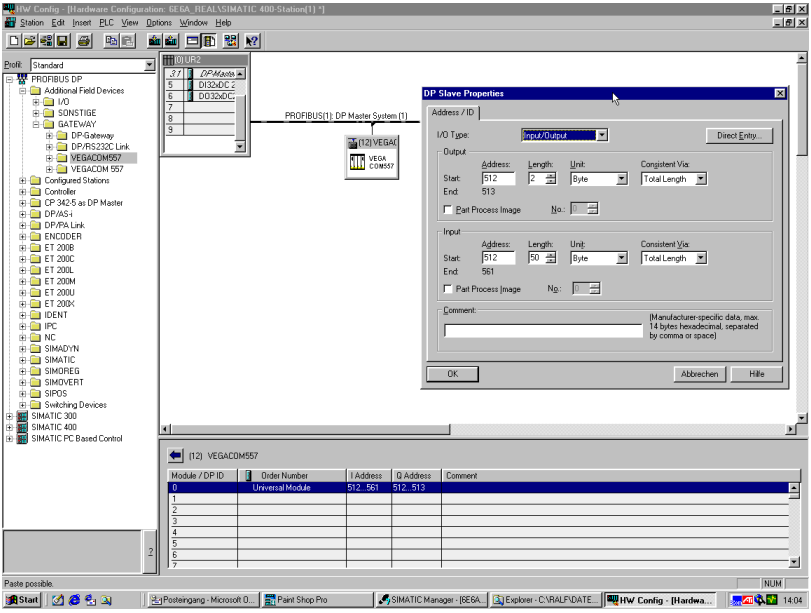
I. Selection of the operating mode:
As soon as VEGACOM 557 has been allocated, the enquiry for the operating mode is made. In this window „Selection of the desired configuration“ the requested operating mode must be selected.

II. Allocate Slave address:
After selection of the operating mode, the enquiry for the Slave address and the Profibus adjustments (baud rate etc.) is made in an additional window.

The planned Slave address must correspond to the Slave address that was set with the DIL-switch on VEGACOM 557.

III. Allocation of input and output addresses for VEGACOM 557
In the window „Properties - DP-Slave“ the input and output addresses for VEGACOM 557 can be allocated. The window can be reached by marking VEGACOM 557 (clicking the ICON of VEGACOM 557) and double clicking in the chart of VEGACOM 557 in the line with „Universalmodul“. In the window that opens, the initial address of the input or output section can be determined. The „Length“, „Unit“ and „Consistent over“ must not be modified. The number of bytes reserved by VEGACOM 557 in the address space of S7, depends on the selected operating mode.

Operating mode	Length input section (Byte)	Output section (Byte)
50 Byte IN, 2 Byte OUT (50E2A)	50	2
6 Byte IN, 6 Byte OUT (6E6A)	6	6



Providing of input and output addresses for VEGACOM 557

The planned output and input addresses are important when using the example project on the utility diskette. In the example project (enquiry of FB 220) the two addresses must be transferred as enquiry parameters (see also „s7_doku.pdf“ on the utility diskette).

After the Profibus-Slave VEGACOM 557 has been planned and the PLC loaded, the bus error LED on the Profibus-Master must extinguish and the green „BA“-LED on VEGACOM 557 must light per manently. If this occurs, the Profibus communication between PLC and VEGACOM 557 is functioning.

Example projects on the utility diskette

An example program for the operating mode 50E2A and an example pr ogram for the oper - ating mode 6E6A is available on the utility diskette for reading measured values out of VEGACOM 557. Further information on configuration and function are included in the PDF file „s7-doku.pdf“. To view the file, the „Akrobat Reader“ is required. Please contact VEGA Grieshaber KG if you need further example programs or assistance.

8.3 Setup SIEMENS S5 with IM308C

In this case, the DP-Master is the communication processor IM308C from SIEMENS, which can be plugged into the automation instruments S5-115U, S5-135U and S5-155U.

The basic requirements for a successful setup are an IM308C from version 2 and the planning software COM PROFIBUS or COM ET200 Windows from version 2.0. Only with these or later versions does SIEMENS supports consistent data over a greater length.

The complete sequence of the setup is described in the PDF file „5OE2H.pdf“ or „6E6A.pdf“ included on the utility diskette. In addition, the diskette includes S5 example programs which are also described in the PDF file „5OE2H.pdf“ or „6E6A.pdf“.

9 Parameter adjustment via Profibus DP

VEGACOM 557 also provides the option of enquiring and modifying different parameters of the VEGALOG or VEGAMET signal conditioning instruments (relating to measurement loop).

The following list gives an overview of the affected parameters:

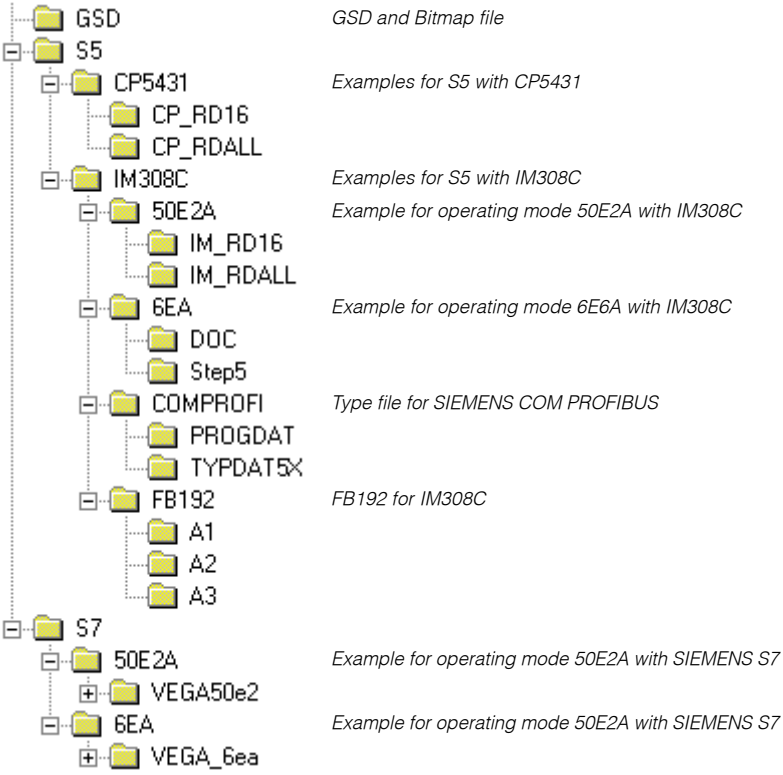
Parameter name	possible access mode	
Density	reading	writing
Relay switching point (top)	reading	writing
Relay switching point (bottom)	reading	writing
Integration time	reading	writing
Scaling (0 %)	reading	writing
Scaling (100 %)	reading	writing
Current offset	reading	writing
Activate offset adjustment	–	writing

Independent of the connected VEGA signal conditioning instrument (VEGAMET or VEGALOG), the enquiry or modification of parameters is made via the Profibus always according to the same procedure. For this, it is obligatory to plan operating mode 6E6A. In the 6 Byte data section (inputs/outputs), the data of the parameter enquiries are transferred to VEGACOM 557. The enquired parameter is delivered or confirmed (if the parameter has been modified) in the answering data of VEGACOM 557 (6 Byte inputs of the Profibus-Master).

For further information, please contact one of our employees.

10 Utility diskette for VEGACOM 557 Profibus DP

On the supplied utility diskette you will find two files, a self-unpacking „EXE“ file and a text file with a short description. By executing the „PROFIBUS.EXE“ file, the files will be unpacked. After unpacking the „PROFIBUS.EXE“ file, the following directory structure is available:



Directory structure of the utility diskette

Supplem. A Complete overview of the data image of measured values in VEGACOM 557:

Block number	Byte number in block	VEGALOG control command: 0xCC		Sorting acc. to VEGAMET addresses Control command: 0xCC			Sorting acc. to channels / DCS indices Control command: 0xCC		
		Index	DCS no.	Index	VEGAMET 509...512	VEGAMET 513...614	Index	VEGAMET 509...512	VEGAMET 513...614
1	3...8	0x01	DCS 1	-	-	-	-	-	-
	9...14	0x02	DCS 2	-	-	-	0x11	MET1, CH1	MET1, DCS1
	15...20	0x03	DCS 3	-	-	-	0x21	MET2, CH1	MET2, DCS1
	21...26	0x04	DCS 4	-	-	-	0x31	MET3, CH1	MET3, DCS1
	27...32	0x05	DCS 5	-	-	-	0x41	MET4, CH1	MET4, DCS1
	33...38	0x06	DCS 6		-	-	0x51	MET5, CH1	MET5, DCS1
	39...44	0x07	DCS 7	-	-	-	0x61	MET6, CH1	MET6, DCS1
	45...50	0x08	DCS 8	-	-	-	0x71	MET7, CH1	MET7, DCS1
2	3...8	0x09	DCS 9	-	-	-	0x81	MET8, CH1	MET8, DCS1
	9...14	0x0A	DCS 10	-	-	-	0x91	MET9, CH1	MET9, DCS1
	15...20	0x0B	DCS 11	-	-	-	0xA1	MET10, CH1	MET10, DCS1
	21...26	0x0C	DCS 12	-	-	-	0xB1	MET11, CH1	MET11, DCS1
	27...32	0x0D	DCS 13	-	-	-	0xC1	MET12, CH1	MET12, DCS1
	33...38	0x0E	DCS 14		-	-	0xD1	MET13, CH1	MET13, DCS1
	39...44	0x0F	DCS 15	-	-	-	0xE1	MET14, CH1	MET14, DCS1
	45...50	0x10	DCS 16	-	-	-	0xF1	MET15, CH1	MET15, DCS1
3	3...8	0x11	DCS 17	0x11	MET1, CH1	MET1, DCS1	-	-	-
	9...14	0x12	DCS 18	0x12	MET1, CH2	MET1, DCS2	0x12	MET1, CH2	MET1, DCS2
	15...20	0x13	DCS 19	0x13	MET1, CH3	MET1, DCS3	0x22	MET2, CH2	MET2, DCS2
	21...26	0x14	DCS 20	0x14	-	MET1, DCS4	0x32	MET3, CH2	MET3, DCS2
	27...32	0x15	DCS 21	0x15	-	MET1, DCS5	0x42	MET4, CH2	MET4, DCS2
	33...38	0x16	DCS 22	0x16	-	MET1, DCS6	0x52	MET5, CH2	MET5, DCS2
	39...44	0x17	DCS 23	0x17	-	MET1, DCS7	0x62	MET6, CH2	MET6, DCS2
	45...50	0x18	DCS 24	-	-	-	0x72	MET7, CH2	MET7, DCS2
4	3...8	0x19	DCS 25	-	-	-	0x82	MET8, CH2	MET8, DCS2
	9...14	0x1A	DCS 26	-	-	-	0x92	MET9, CH2	MET9, DCS2
	15...20	0x1B	DCS 27	-	-	-	0xA2	MET10, CH2	MET10, DCS2
	21...26	0x1C	DCS 28	-	-	-	0xB2	MET11, CH2	MET11, DCS2
	27...32	0x1D	DCS 29	-	-	-	0xC2	MET12, CH2	MET12, DCS2
	33...38	0x1E	DCS 30	-	-	-	0xD2	MET13, CH2	MET13, DCS2
	39...44	0x1F	DCS 31	-	-	-	0xE2	MET14, CH2	MET14, DCS2
	45...50	0x20	DCS 32	-	-	-	0xF2	MET15, CH2	MET15, DCS2
5	3...8	0x21	DCS 33	0x21	MET2, CH1	MET2, DCS1	-	-	-
	9...14	0x22	DCS 34	0x22	MET2, CH2	MET2, DCS2	0x13	MET1, CH3	MET1, DCS3
	15...20	0x23	DCS 35	0x23	MET2, CH3	MET2, DCS3	0x23	MET2, CH3	MET2, DCS3
	21...26	0x24	DCS 36	0x24		MET2, DCS4	0x33	MET3, CH3	MET3, DCS3
	27...32	0x25	DCS 37	0x25		MET2, DCS5	0x43	MET4, CH3	MET4, DCS3
	33...38	0x26	DCS 38	0x26		MET2, DCS6	0x53	MET5, CH3	MET5, DCS3
	39...44	0x27	DCS 39	0x27		MET2, DCS7	0x63	MET6, CH3	MET6, DCS3
	45...50	0x28	DCS 40	-	-	-	0x73	MET7, CH3	MET7, DCS3

Block number	Byte number in block	VEGALOG control command: 0xCC		Sorting acc. to VEGAMET addresses Control command: 0xCC			Sorting acc. to channels / DCS indices Control command: 0xCC		
		Index	DCS no.	Index	VEGAMET 509...512	VEGAMET 513...614	Index	VEGAMET 509...512	VEGAMET 513...614
6	3...8	0x29	DCS 41	-	-	-	0x83	MET8, CH3	MET8, DCS3
	9...14	0x2A	DCS 42	-	-	-	0x93	MET9, CH3	MET9, DCS3
	15...20	0x2B	DCS 43	-	-	-	0xA3	MET10, CH3	MET10, DCS3
	21...26	0x2C	DCS 44	-	-	-	0xB3	MET11, CH3	MET11, DCS3
	27...32	0x2D	DCS45	-	-	-	0xC3	MET12, CH3	MET12, DCS3
	33...38	0x2E	DCS 46		-	-	0xD3	MET13, CH3	MET13, DCS3
	39...44	0x2F	DCS 47	-	-	-	0xE3	MET14, CH3	MET14, DCS3
	45...50	0x30	DCS 48	-	-	-	0xF3	MET15, CH3	MET15, DCS3
7	3...8	0x31	DCS 49	0x31	MET3, CH1	MET3, DCS1	-	-	-
	9...14	0x32	DCS 50	0x32	MET3, CH2	MET3, DCS2	0x14	-	MET1, DCS4
	15...20	0x33	DCS 51	0x33	MET3 CH3	MET3, DCS3	0x24	-	MET2 DCS4
	21...26	0x34	DCS 52	0x34	-	MET3, DCS4	0x34	-	MET3, DCS4
	27...32	0x35	DCS 53	0x35	-	MET3, DCS5	0x44	-	MET4, DCS4
	33...38	0x36	DCS 54	0x36	-	MET3, DCS6	0x54	-	MET5, DCS4
	39...44	0x37	DCS 55	0x37	-	MET3, DCS7	0x64	-	MET6, DCS4
	45...50	0x38	DCS 56	-	-	-	0x74	-	MET7, DCS4
8	3...8	0x39	DCS 57	-	-	-	0x84	-	MET8, DCS4
	9...14	0x3A	DCS 58	-	-	-	0x94	-	MET9, DCS4
	15...20	0x3B	DCS 59	-	-	-	0xA4	-	MET10, DCS4
	21...26	0x3C	DCS 60	-	-	-	0xB4	-	MET11, DCS4
	27...32	0x3D	DCS 61	-	-	-	0xC4	-	MET12, DCS4
	33...38	0x3E	DCS 62	-	-	-	0xD4	-	MET13, DCS4
	39...44	0x3F	DCS 63	-	-	-	0xE4	-	MET14, DCS4
	45...50	0x40	DCS 64	-	-	-	0xF4	-	MET15, DCS4
9	3...8	0x41	DCS 65	0x41	-	MET4, DCS1	-	-	-
	9...14	0x42	DCS 66	0x42	-	MET4, DCS2	0x15	-	MET1, DCS5
	15...20	0x43	DCS 67	0x43	-	MET4, DCS3	0x25	-	MET2 DCS5
	21...26	0x44	DCS 68	0x44	-	MET4, DCS4	0x35	-	MET3, DCS5
	27...32	0x45	DCS 69	0x45	-	MET4, DCS5	0x45	-	MET4, DCS5
	33...38	0x46	DCS 70	0x46	-	MET4, DCS6	0x55	-	MET5, DCS5
	39...44	0x47	DCS 71	0x47	-	MET4, DCS7	0x65	-	MET6, DCS5
	45...50	0x48	DCS 72	-	-	-	0x75	-	MET7, DCS5
10	3...8	0x49	DCS 73	-	-	-	0x85	-	MET8, DCS5
	9...14	0x4A	DCS 74	-	-	-	0x95	-	MET9, DCS5
	15...20	0x4B	DCS 75	-	-	-	0xA5	-	MET10, DCS5
	21...26	0x4C	DCS 76	-	-	-	0xB5	-	MET11, DCS5
	27...32	0x4D	DCS 77	-	-	-	0xC5	-	MET12, DCS5
	33...38	0x4E	DCS 78	-	-	-	0xD5	-	MET13, DCS5
	39...44	0x4F	DCS 79	-	-	-	0xE5	-	MET14, DCS5
	45...50	0x50	DCS 80	-	-	-	0xF5	-	MET15, DCS5

Block number	Byte number in block	VEGALOG Steuerkommando: 0xCC		Sorting acc. to VEGAMET addresses Control command: 0xCC			Sorting acc. to channels / DCS indices Control command: 0xCC		
		Index	DCS no.	Index	VEGAMET 509...512	VEGAMET 513...614	Index	VEGAMET 509...512	VEGAMET 513...614
11	3...8	0x51	DCS 81	0x51	-	MET5, DCS1	-	-	-
	9...14	0x52	DCS 82	0x52	-	MET5, DCS2	0x16	-	MET1, DCS6
	15...20	0x53	DCS 83	0x53	-	MET5, DCS3	0x26	-	MET2, DCS6
	21...26	0x54	DCS 84	0x54	-	MET5, DCS4	0x36	-	MET3, DCS6
	27...32	0x55	DCS 85	0x55	-	MET5, DCS5	0x46	-	MET4, DCS6
	33...38	0x56	DCS 86	0x56	-	MET5, DCS6	0x56	-	MET5, DCS6
	39...44	0x57	DCS 87	0x57	-	MET5, DCS7	0x66	-	MET6, DCS6
	45...50	0x58	DCS 88	-	-	-	0x76	-	MET7, DCS6
12	3...8	0x59	DCS 89	-	-	-	0x86	-	MET8, DCS6
	9...14	0x5A	DCS 90	-	-	-	0x96	-	MET9, DCS6
	15...20	0x5B	DCS 91	-	-	-	0xA6	-	MET10, DCS6
	21...26	0x5C	DCS 92	-	-	-	0xB6	-	MET11, DCS6
	27...32	0x5D	DCS 93	-	-	-	0xC6	-	MET12, DCS6
	33...38	0x5E	DCS 94		-	-	0xD6	-	MET13, DCS6
	39...44	0x5F	DCS 95	-	-	-	0xE6	-	MET14, DCS6
	45...50	0x60	DCS 96	-	-	-	0xF6	-	MET15, DCS6
13	3...8	0x61	DCS 97	0x61	-	MET6, DCS1	-	-	-
	9...14	0x62	DCS 98	0x62	-	MET6, DCS2	0x17	-	MET1, DCS7
	15...20	0x63	DCS 99	0x63	-	MET6, DCS3	0x27	-	MET2, DCS7
	21...26	0x64	DCS 100	0x64	-	MET6, DCS4	0x37	-	MET3, DCS7
	27...32	0x65	DCS 101	0x65	-	MET6, DCS5	0x47	-	MET4, DCS7
	33...38	0x66	DCS 102	0x66	-	MET6, DCS6	0x57	-	MET5, DCS7
	39...44	0x67	DCS 103	0x67	-	MET6, DCS7	0x67	-	MET6, DCS7
	45...50	0x68	DCS 104	-	-	-	0x77	-	MET7, DCS7
14	3...8	0x69	DCS 105	-	-	-	0x87	-	MET8, DCS7
	9...14	0x6A	DCS 106	-	-	-	0x97	-	MET9, DCS7
	15...20	0x6B	DCS 107	-	-	-	0xA7	-	MET10, DCS7
	21...26	0x6C	DCS 108	-	-	-	0xB7	-	MET11, DCS7
	27...32	0x6D	DCS 109	-	-	-	0xC7	-	MET12, DCS7
	33...38	0x6E	DCS 110	-	-	-	0xD7	-	MET13, DCS7
	39...44	0x6F	DCS 111	-	-	-	0xE7	-	MET14, DCS7
	45...50	0x70	DCS 112	-	-	-	0xF7	-	MET15, DCS7
15	3...8	0x71	DCS 113	0x71	-	MET7, DCS1	-	-	-
	9...14	0x72	DCS 114	0x72	-	MET7, DCS2	-	-	-
	15...20	0x73	DCS 115	0x73	-	MET7, DCS3	-	-	-
	21...26	0x74	DCS 116	0x74	-	MET7, DCS4	-	-	-
	27...32	0x75	DCS 117	0x75	-	MET7, DCS5	-	-	-
	33...38	0x76	DCS 118	0x76	-	MET7, DCS6	-	-	-
	39...44	0x77	DCS 119	0x77	-	MET7, DCS7	-	-	-
	45...50	0x78	DCS 120	-	-	-	-	-	-

Block number	Byte number in block	VEGALOG control command: 0xCC		Sorting acc. to VEGAMET addresses Control command: 0xCC			Sorting acc. to channels / DCS indices Control command: 0xCC		
		Index	DCS no.	Index	VEGAMET 509...512	VEGAMET 513...614	Index	VEGAMET 509...512	VEGAMET 513...614
16	3...8	0x79	DCS 121	-	-	-	-	-	-
	9...14	0x7A	DCS 122	-	-	-	-	-	-
	15...20	0x7B	DCS 123	-	-	-	-	-	-
	21...26	0x7C	DCS 124	-	-	-	-	-	-
	27...32	0x7D	DCS 125	-	-	-	-	-	-
	33...38	0x7E	DCS 126	-	-	-	-	-	-
	39...44	0x7F	DCS 127	-	-	-	-	-	-
	45...50	0x80	DCS 128	-	-	-	-	-	-
17	3...8	0x81	DCS 129	0x81		MET8, DCS1	-	-	-
	9...14	0x82	DCS 130	0x82		MET8, DCS2	-	-	-
	15...20	0x83	DCS 131	0x83		MET8, DCS3	-	-	-
	21...26	0x84	DCS 132	0x84		MET8, DCS4	-	-	-
	27...32	0x85	DCS 133	0x85		MET8, DCS5	-	-	-
	33...38	0x86	DCS 134	0x86		MET8, DCS6	-	-	-
	39...44	0x87	DCS 135	0x87		MET8, DCS7	-	-	-
	45...50	0x88	DCS 136	-	-	-	-	-	-
18	3...8	0x89	DCS 137	-	-	-	-	-	-
	9...14	0x8A	DCS 138	-	-	-	-	-	-
	15...20	0x8B	DCS 139	-	-	-	-	-	-
	21...26	0x8C	DCS 140	-	-	-	-	-	-
	27...32	0x8D	DCS 141	-	-	-	-	-	-
	33...38	0x8E	DCS 142	-	-	-	-	-	-
	39...44	0x8F	DCS 143	-	-	-	-	-	-
	45...50	0x90	DCS 144	-	-	-	-	-	-
19	3...8	0x91	DCS 145	0x91		MET9, DCS1	-	-	-
	9...14	0x92	DCS 146	0x92		MET9, DCS2	-	-	-
	15...20	0x93	DCS 147	0x93		MET9, DCS3	-	-	-
	21...26	0x94	DCS 148	0x94		MET9, DCS4	-	-	-
	27...32	0x95	DCS 149	0x95		MET9, DCS5	-	-	-
	33...38	0x96	DCS 150	0x96		MET9, DCS6	-	-	-
	39...44	0x97	DCS 151	0x97		MET9, DCS7	-	-	-
	45...50	0x98	DCS 152	-	-	-	-	-	-
20	3...8	0x99	DCS 153	-	-	-	-	-	-
	9...14	0x9A	DCS 154	-	-	-	-	-	-
	15...20	0x9B	DCS 155	-	-	-	-	-	-
	21...26	0x9C	DCS 156	-	-	-	-	-	-
	27...32	0x9D	DCS 157	-	-	-	-	-	-
	33...38	0x9E	DCS 158	-	-	-	-	-	-
	39...44	0x9F	DCS 159	-	-	-	-	-	-
	45...50	0x100	DCS 160	-	-	-	-	-	-

Block number	Byte number in block	VEGALOG control command: 0xCC		Sorting acc. to VEGAMET addresses Control command: 0xCC			Sorting acc. to channels / DCS indices Control command: 0xCC		
		Index	DCS no.	Index	VEGAMET 509...512	VEGAMET 513...614	Index	VEGAMET 509...512	VEGAMET 513...614
21	3...8	0xA1	DCS 161	0xA1	-	MET10, DCS1	-	-	-
	9...14	0xA2	DCS 162	0xA2	-	MET10, DCS2	-	-	-
	15...20	0xA3	DCS 163	0xA3	-	MET10, DCS3	-	-	-
	21...26	0xA4	DCS 164	0xA4	-	MET10, DCS4	-	-	-
	27...32	0xA5	DCS 165	0xA5	-	MET10, DCS5	-	-	-
	33...38	0xA6	DCS 166	0xA6	-	MET10, DCS6	-	-	-
	39...44	0xA7	DCS 167	0xA7	-	MET10, DCS7	-	-	-
	45...50	0xA8	DCS 168	-	-	-	-	-	-
22	3...8	0xA9	DCS 169	-	-	-	-	-	-
	9...14	0xAA	DCS 170	-	-	-	-	-	-
	15...20	0xAB	DCS 171	-	-	-	-	-	-
	21...26	0xAC	DCS 172	-	-	-	-	-	-
	27...32	0xAD	DCS 173	-	-	-	-	-	-
	33...38	0xAE	DCS 174		-	-	-	-	-
	39...44	0xAF	DCS 175	-	-	-	-	-	-
	45...50	0xB0	DCS 176	-	-	-	-	-	-
23	3...8	0xB1	DCS 177	0xB1	-	MET11, DCS1	-	-	-
	9...14	0xB2	DCS 178	0xB2	-	MET11, DCS2	-	-	-
	15...20	0xB3	DCS 179	0xB3	-	MET11, DCS3	-	-	-
	21...26	0xB4	DCS 180	0xB4	-	MET11, DCS4	-	-	-
	27...32	0xB5	DCS 181	0xB5	-	MET11, DCS5	-	-	-
	33...38	0xB6	DCS 182	0xB6	-	MET11, DCS6	-	-	-
	39...44	0xB7	DCS 183	0xB7	-	MET11, DCS7	-	-	-
	45...50	0xB8	DCS 184	-	-	-	-	-	-
24	3...8	0xB9	DCS 185	-	-	-	-	-	-
	9...14	0xBA	DCS 186	-	-	-	-	-	-
	15...20	0xBB	DCS 187	-	-	-	-	-	-
	21...26	0xBC	DCS 188	-	-	-	-	-	-
	27...32	0xBD	DCS 189	-	-	-	-	-	-
	33...38	0xBE	DCS 190	-	-	-	-	-	-
	39...44	0xBF	DCS 191	-	-	-	-	-	-
	45...50	0xC0	DCS 192	-	-	-	-	-	-
25	3...8	0xC1	DCS 193	0xC1	-	MET12, DCS1	-	-	-
	9...14	0xC2	DCS 194	0xC2	-	MET12, DCS2	-	-	-
	15...20	0xC3	DCS 195	0xC3	-	MET12, DCS3	-	-	-
	21...26	0xC4	DCS 196	0xC4	-	MET12, DCS4	-	-	-
	27...32	0xC5	DCS 197	0xC5	-	MET12, DCS5	-	-	-
	33...38	0xC6	DCS 198	0xC6	-	MET12, DCS6	-	-	-
	39...44	0xC7	DCS 199	0xC7	-	MET12, DCS7	-	-	-
	45...50	0xC8	DCS 200	-	-	-	-	-	-

Block number	Byte number in block	VEGALOG control command: 0xCC		Sorting acc. to VEGAMET addresses Control command: 0xCC			Sorting acc. to channels / DCS indices Control command: 0xCC		
		Index	DCS no.	Index	VEGAMET 509...512	VEGAMET 513...614	Index	VEGAMET 509...512	VEGAMET 513...614
31	3...8	0xF1	DCS 241	0xF1	-	MET15, DCS1	-	-	-
	9...14	0xF2	DCS 242	0xF2	-	MET15, DCS2	-	-	-
	15...20	0xF3	DCS 243	0xF3	-	MET15, DCS3	-	-	-
	21...26	0xF4	DCS 244	0xF4	-	MET15, DCS4	-	-	-
	27...32	0xF5	DCS 245	0xF5	-	MET15, DCS5	-	-	-
	33...38	0xF6	DCS 246	0xF6	-	MET15, DCS6	-	-	-
	39...44	0xF7	DCS 247	0xF7	-	MET15, DCS7	-	-	-
	45...50	0xF8	DCS 248	-	-	-	-	-	-
32	3...8	0xF9	DCS 249	-	-	-	-	-	-
	9...14	0xFA	DCS 250	-	-	-	-	-	-
	15...20	0xFB	DCS 251	-	-	-	-	-	-
	21...26	0xFC	DCS 252	-	-	-	-	-	-
	27...32	0xFD	DCS 253	-	-	-	-	-	-
	33...38	0xFE	DCS 254		-	-	-	-	-
	39...44	0xFF	DCS 255	-	-	-	-	-	-
	45...50	-	-	-	-	-	-	-	-

Supplement B

Complete overview of the process image of switching conditions in VEGACOM 557:

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
33	3	7	1	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	4	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	5	7	2	Status output contacts	VEGA-MET 1	Status output contacts
		6		-		
		5		-		
		4		-		
		3		-		
		2		-		
		1		Output contact 10		Intput contact 2
		0		Output contact 9		Intput contact 1
	6	7		Output contact 8		Status output contacts
		6		Output contact 7		
		5		Output contact 6		
		4		Output contact 5		
		3		Output contact 4		
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ output contact number	DISBUS address	Status/ Output/ input contact number
33	7	7	3	Status output contacts	VEGA-MET 2	Status input contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	8	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1
	9	7	4	Status output contacts	VEGA-MET 3	Status output contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	10	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module-number	Status/ Output contact number	DISBUS-Adresse	Status/ Output/ input contact number
33	11	7	5	Status output contacts	VEGA-MET 4	Status input contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	12	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1
	13	7	6	Status output contacts	VEGA-MET 5	Status output contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	14	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module-number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
33	15	7	7	Status output contacts	VEGA-MET 6	Status input contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	16	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1
	17	7	8	Status output contacts	VEGA-MET 7	Status output contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	18	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
33	19	7	9	Status output contacts	VEGA-MET 8	Status input contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	20	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1
	21	7	10	Status output contacts	VEGA-MET 9	Status output contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	22	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
33	23	7	11	Status output contacts	VEGA-MET 10	Status input contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	24	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1
	25	7	12	Status output contacts	VEGA-MET 11	Status output contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	26	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
33	27	7	13	Status output contacts	VEGA-MET 12	Status input contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	28	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1
	29	7	14	Status output contacts	VEGA-MET 13	Status output contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	30	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module-number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
33	31	7	15	Status output contacts	VEGA-MET 14	Status input contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	32	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1
	33	7	16	Status output contacts	VEGA-MET 15	Status input contacts
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		Input contact 2
		0		Output contact 9		Input contact 1
	34	7		Output contact 8		Status output contacts
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		Fail safe relay
		1		Output contact 2		Output contact 2
		0		Output contact 1		Output contact 1

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
34	3	7	17	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	4	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	5	7	18	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	6	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
34	7	7	19	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	8	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	9	7	20	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	10	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
34	11	7	21	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	12	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	13	7	22	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	14	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
34	15	7	23	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	16	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	17	7	24	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	18	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
34	19	7	25	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	20	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	21	7	26	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	22	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
34	23	7	27	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	24	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	25	7	28	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	26	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-

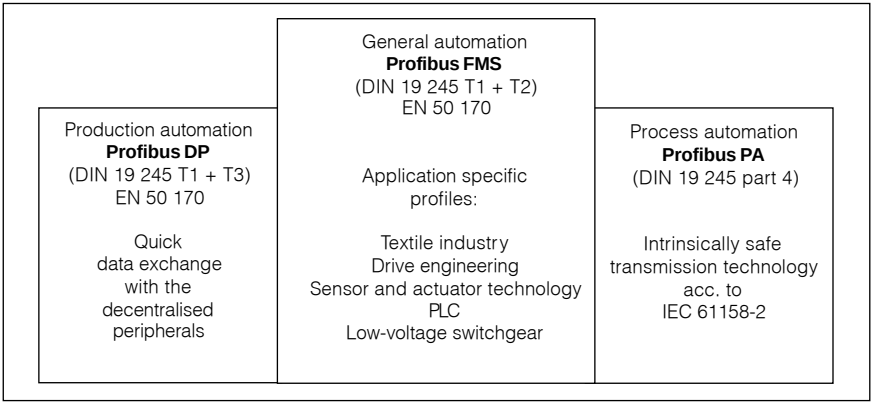
Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
34	27	7	29	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	28	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	29	7	30	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	30	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-

Block number	Byte number in block	Bit number	VEGALOG control command: 0xCC		VEGAMET control command: 0xCC	
			Module number	Status/ Output contact number	DISBUS address	Status/ Output/ input contact number
34	31	7	31	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	32	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-
	33	7	32	Status output contacts	-	-
		6		-		-
		5		-		-
		4		-		-
		3		-		-
		2		-		-
		1		Output contact 10		-
		0		Output contact 9		-
	34	7		Output contact 8		-
		6		Output contact 7		-
		5		Output contact 6		-
		4		Output contact 5		-
		3		Output contact 4		-
		2		Output contact 3		-
		1		Output contact 2		-
		0		Output contact 1		-

Supplement C

1 General information on PROFIBUS

Note:
This chapter is an excerpt of the PNO documentation PROFIBUS, and is to be used only as an informational aid.



PROFIBUS consists of three versions for different applications:

Profibus FMS
The FMS services (Fieldbus Message Specification) open a wide application range, offer considerable flexibility, and ensure that comprehensive communication tasks with cyclical or acyclical data traffic can be managed at medium speed.

Since 1990, Profibus FMS is published as standard in DIN 19 245, part 1 and part 2. Along with the European Fieldbus standardisation, Profibus FMS will be integrated in the European Fieldbus standard EN 50 170.

Profibus DP
This speed-optimised Profibus version (DP = decentralised periphery), is especially suitable for communication between automation systems and the decentralised peripherals.

Profibus DP is based on DIN 19 245 part 1 and user-specific extensions deter mined in the German standardisation DIN 19 245, part 3 (published 1993). Along with the European Fieldbus standardisation, Profibus DP is integrated in the European Fieldbus standard EN 50 170.

Profibus PA
Profibus PA (PA = process automation) is the Profibus version for applications in process automation. Profibus PA uses the intrinsically safe transmission technology determined in IEC 61158-2, and enables the remote power supply of the participants via the bus on a two-wire cable.

Profibus PA enables the connection of sensors and actuators to a common bus cable (also in hazardous areas).

Instrument profiles determine the instrument specific functions.

Basic properties of Profibus FMS and Profibus DP

PROFIBUS determines the technical and functional properties of a series field bus system, through which distributed, digital field automation instruments in the lower (sensor/actuator level) up to the medium (cell level) power range can be connected. PROFIBUS distinguishes between Master and Slave instruments.

Master instruments determine the data traffic on the bus. A master can send messages without external request, provided the master is authorised for bus access. In the Profibus protocol, Masters are also called active participants.

Slave instruments are low-expenditure peripherals. Typical Slave instruments ar e sensors, actuators, transmitters. They do not receive authorisation for bus access, i.e. they are only allowed to acknowledge received messages or transmit messages to a Master on its request. Slaves are also called passive participants. They require only a small portion of the bus protocol, and as a result, a very low-expenditure implementation of the bus protocol is ensured.

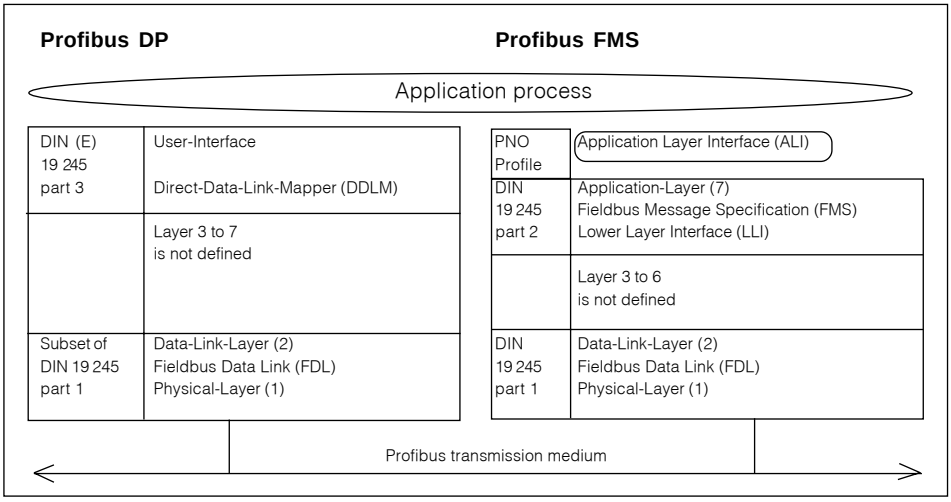
Protocol architecture

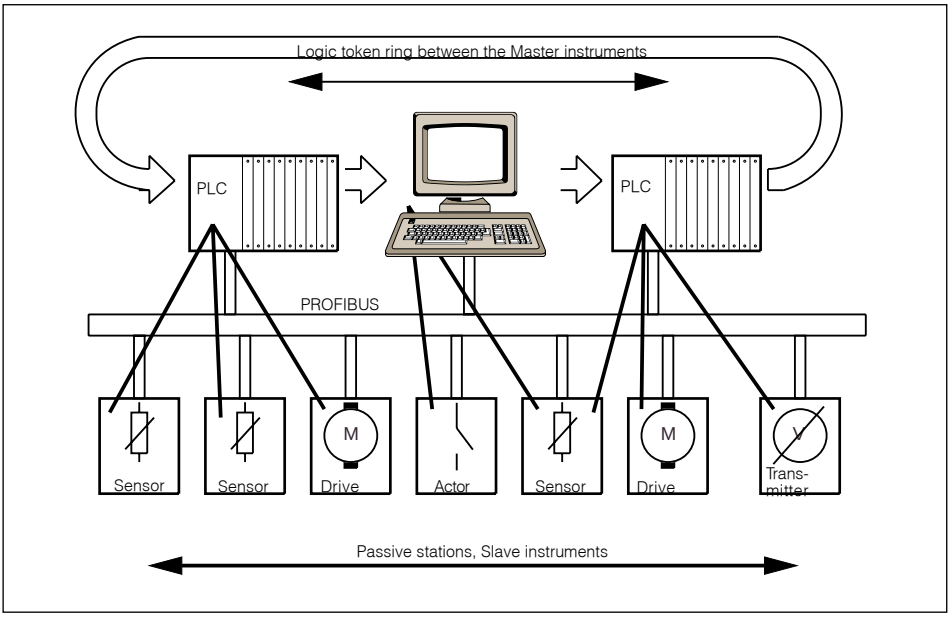
PROFIBUS is based on a number of approved international and national standards. The protocol architecture orients itself on OSI (Open System Interconnection) multilayer system, according to the international standard ISO 7498. The architecture of the Profibus FMS and the Profibus DP protocol is shown in figure 2.

PROFIBUS layer 1 (Physical Layer)
The application range of a Fieldbus system is mainly determined by the selection of the transmission medium and the physical bus interface. Beside the demands on the transmission r eliability, t he e xpenditures for pr ocurement and installation of the bus cable are of gr eat consequence. That 's why the Pr ofibus standard makes provision for different versions of transmission technology , while keeping to a single, uniform bus protocol.

PROFIBUS layer 2 (Data Link Layer)
The second layer of the OSI multilayer system realises the functions of the bus access control and data backup, as well as the managing of transmission protocols and telegrams. Layer 2 is called Fieldbus Data Link (FDL) with PROFIBUS.

Protocol architecture





Hybrid bus access procedure

Therefore, the Profibus bus access procedure includes the Token-Passing procedure for communication among complex bus participants (Master), and underlies the Master - Slave procedure for communication of the complex bus participants with low-expenditure peripherals (Slaves). This combined procedure is called hybrid bus access procedure (see figure 3).

The **Token-Passing procedure** enpowers the Token to distribute the bus access authorisation within an exactly defined time frame. The Token message, a special telegram for transmission of the dispatch authorisation from one Master to the next Master, must be transferr ed to each Master in sequence with a (parameter definable) max. Token circulation period. The Token-Passing procedure is used on the PROFIBUS only between the complex participants (Master).

The **Master-Slave procedure** enables the Master (active participant), currently in possession of the dispatch authorisation, to contact its allocated Slave instruments (passive participant). The Master has here the option of transferring messages to the Slaves or collecting messages from the Slaves.

Figure 3 shows a Profibus structure with three active participants (Masters) and seven passive participants (Slaves). The three Master instruments form a logic token ring.

The PROFIBUS layer 2 operates without a connection. It enables, beside the logic point-to-point data transmission, also the multiple point transmission with broadcast and multicast communication.

With **broadcast communication,** an active participant emits an unacknowledged message to all other participants (Master and Slaves).

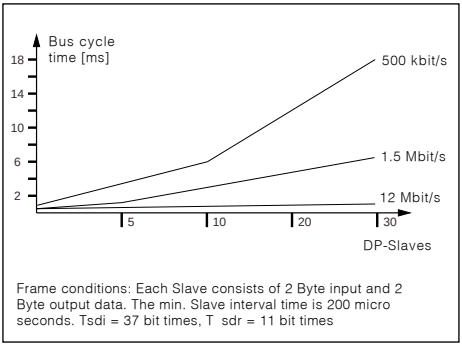
With **multicast communication,** an active participant emits an unacknowledged message to a group of participants (Master and Slaves).

2 Special information on Profibus DP

Profibus DP is designed for quick data exchange on the sensor/actuator level. Here, central control instruments (such as e.g. PLC) communicate via a quick, serial connection with decentralised input and output instruments. The data exchange with these decentralised instruments is mainly done on a cyclical basis. The central control (Master) reads the input information of the Slaves and writes the output information to the Slaves. Thereby the bus cycle time must be shorter than the programming cycle time of the central control, which in many applications is approx. 10 ms.

The following diagram shows the transmission time of Profibus DP in relation to the number of participants and the transmission speed.

The considerable speed increase, compared to the Profibus FMS, is particularly due to the fact that the transmission of the input and output data is carried out in a message cycle by using the SRD service (Send and Receive Data Service) of layer 2. Furthermore, the transmission speed has been increased up to 12 Mbit/s and minimum requirements on the efficiency of the protocol implementation have been set.



Bus cycle time of a Profibus DP Mono-Master system

Diagnostic functions

The comprehensive diagnostic functions of Profibus DP enable quick error localisation. The diagnostic messages are transmitted via the bus and evaluated in the Master . They are divided into three levels:

Station-related diagnostic
Message about general operating condition of a participant, e.g. excess temperature or low voltage.

Module-related diagnostic
These messages indicate that within a certain E/A subrange (e.g. 8 Bit output module) of a participant, a diagnostic is due.

Channel-related diagnostic
Here, the reason for the error relating to an individual input/output Bit (channel) is stated, such as e.g. short circuit of output 7.

System configuration and instrument types

With Profibus DP, **mono or multimaster** systems are possible. A high degree of flexibility for system configuration is thereby ensured. Max. 126 instruments (Master or Slaves) can be connected to one bus. The bus structure enables non-reactive coupling and decoupling of stations or step-by-step setup of the system. Later extensions do not influence the stations which are already in operation.

On **monomaster systems,** only one Master is active on the bus during the operating phase of the bus system. In figure 5, the system configuration of a monomaster system is shown. The PLC control is the central control component.

In **multimaster operation,** there are several Masters on one bus. They either form independent subsystems, each consisting of a DPM1 and the respective DP slaves, or additional planning and diagnostic instruments.

Each Profibus DP system consists of different instrument types. Depending on their individual tasks, the instruments can be classified into three types:

DP Master class 1 (DPM1)
This is a central control, exchanging in a predetermined message cycle information with the decentralised stations (DP Slaves). Typical instruments are e.g. PLC, CNC or RC.

DP Master class 2 (DPM2)
Instruments of this type are programming, planning or diagnostic instruments. They are used for setup to create the configuration of the DP system.

DP Slaves
A DP Slave is a peripheral instrument (sensor/actuator), reading in input information and outputting output information to the peripherals. Instruments that only make input or output information are also possible. Typical DP Slaves are instruments with binary inputs/outputs for 24 V or 230 V, analogue inputs, analogue outputs, counters etc.

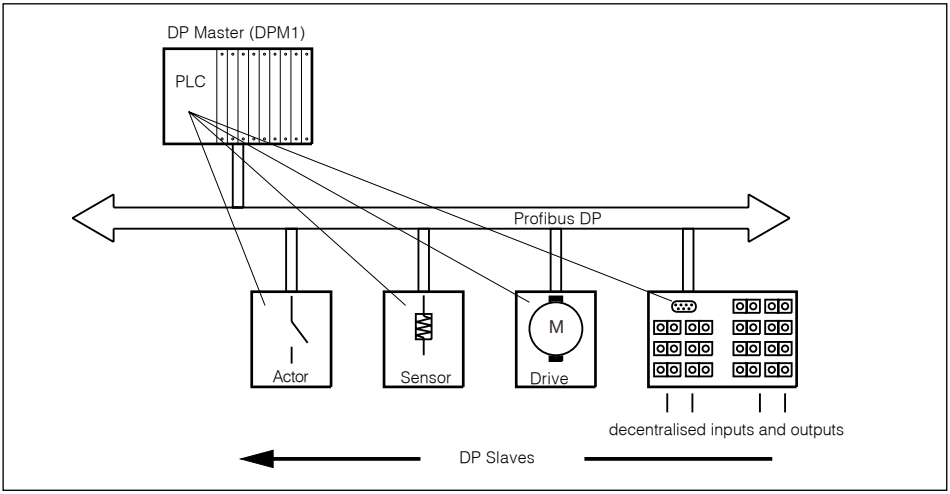
System reaction

The system reaction of Profibus DP has been standardised to ensure large degree of instrument exchangeability. In general, this is determined by the operating condition of the DPM1. The DPM1 can be controlled by the planning instrument either locally or via the bus. There are three different (main) system conditions, as the following explains:

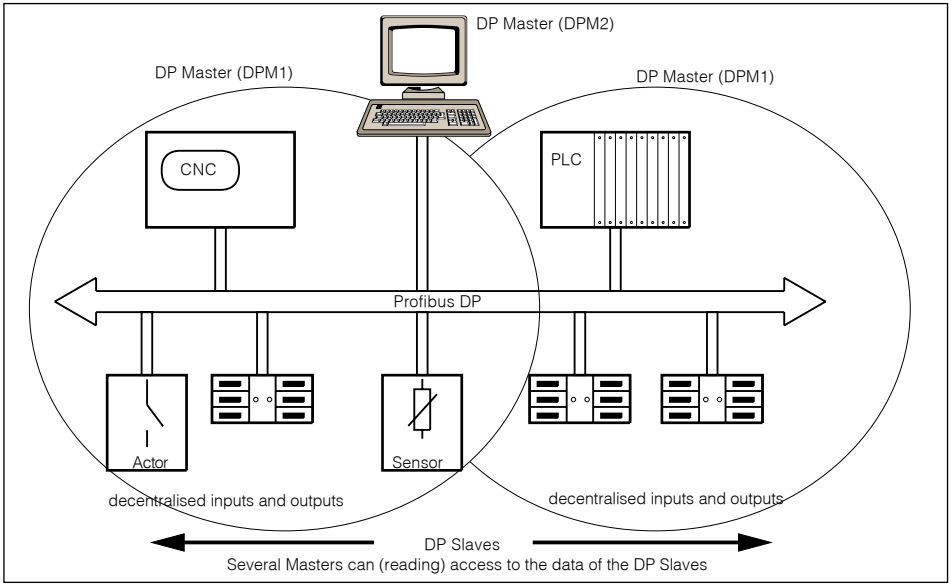
Stop
There is no data traffic between the DPM1 and the DP Slaves.

Clear
DPM1 reads the input information of the DP Slaves and keeps the outputs of the DP Slaves in safe condition.

Operate
DPM1 is in the data transfer phase. The inputs of the DP Slaves are read in a cyclical data traffic and the output information is transferred to the DP Slaves.



Profibus DP mono-master system



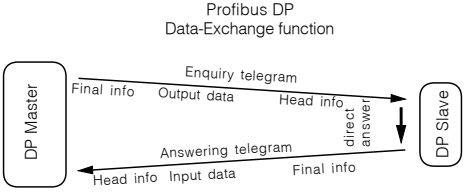
Profibus DP multimaster system

Data traffic between DPM1 and the DP Slaves or planning instruments

The data traffic between the DPM1 and the allocated DP Slaves is carried out automatically by the DPM 1 in a predetermined, recurring sequence. During the planning of the bus system, the user determines the affiliation of a DP Slave to the DPM1. Furthermore, the user defines which DP Slaves will be included in the cyclical useful data traffic and which will be removed again.

Supplementary to the functions between DP Master and DP Slaves, Master -Master communication functions are available (see chart 1). They enable the planning of the system by means of planning and diagnostic instruments via the bus.

In addition to the upload and download functions, the Master -Master functions of fer the option of switching on/off the useful data traffic between the DPM1 and the individual DP Slaves dynamically , and of modifying the operating condition of the DPM1.



Useful data transmission with Profibus DP

Function	Meaning	DPM1	DPM2
Get_Master_Diag	Reading of the diagnostic data of the DMP1 or the collective diagnostics of the DP Slaves		MO
Download / Upload group (Start_Seq, Download / Upload, End_Seq)	Loading or reading of the complete configuration data of a DPM1 and the respective DP Slaves	O	O
Act_Para_Brct	Activation of the bus parameters together for all responded DPM1 instruments.	O	O
Act_Param	Activation of parameters or modifications of the operating condition on the responded DPM1 instrument.	O	O
M: mandatory, O: optional			

Chart 1: Master-Master functions with Profibus DP

Sync and Freeze mode

In addition to the participant-related useful data traffic, handled automatically by the DPM1, it is possible for the DP Masters to send control commands to a Slave, a group, or to all DP Slaves together . These control commands are transferred as multicast functions. With these control commands, the Sync and Freeze modes can be preset for the synchronisation of the DP Slaves. They enable an event-driven synchronisation of the DP Slaves.

The DP Slaves start the Sync mode upon receipt of a Sync control command from the allocated DP Master .

Analogue to this, a Freeze-control command activates the Freeze mode of the contacted DP Slaves.

Open planning

For the Profibus DP, the characteristics of the instruments are documented by the manufacturer in the form of a data sheet and an instrument master file which are made available to the users. Structure, contents and coding of these instrument master data (GSD) are standardised. The PNO archives this information (multivendor) and upon request, provides information on the GSD.

Each DP Slave and each DPM1 must have an individual ID number . This number is required for identification of the connected instrument types (without significant protocol overhead) by the DP Master .

The manufacturers have to apply for an ID number for each DP Slave and each DPM1 at the PNO. The PNO administrates the ID numbers together with the instrument master data.

Mixed operation with Profibus FMS

The common operation of Profibus FMS and Profibus DP components on one bus is a special advantage of PROFIBUS. For applications with reduced demands on system reaction time, the mixed operation of Profibus FMS and Profibus DP components is possible and useful on one bus. Even the simultaneous operation of both protocol versions in one instrument is possible. These instruments are called mixed instruments. Mixed instruments offer advantages for the manufacturer and the user .

The mixed operation is possible, because both protocol versions use unique transmission and bus access procedures (layer 1/2). The different application functions are separated by different service access points of layer 2.

Further information

The PNO represents the Profibus interests of the manufacturers and user and coordinates the maintenance and further development of the Profibus standard.

3 Short description of the interface RS 485

The standard interface RS 485 used in VEGACOM 557 Profibus DP transmits the data serially and asynchronously in bit form. Thereby the conditions "0" and "1" are transmitted (without ground reference) by defined voltage differences between two cables. Usually, the dif ferential voltage of -3...-6V corresponds to a logic "1". A logic „0“ is shown by a differential voltage of +3...+6V.

The advantage of this voltage difference transmission is that possible common-mode interferences cause a symmetrical shifting of the voltage level and cannot distort the useful signal.

Due to the higher interference resistance compared to RS 232, distances up to 1200 m and high data rates up to 12 Mbits can be reached. The interference resistance is also visible on the permissible voltage levels: at an output level of the emitter under load of ±2 V, the r eceiver components r ecognise the level of ±200 mV still as valid signal.

With higher transmission rates and/or larger distances, a termination (adaptation of the wave r esistance) is necessar y.

The bus system can include up to 32 participants, i.e. 1 Master and 31 Slaves. A protocol ensures that at any time max. one participant is active as emitter , whereas the others ar e passively switched. An advantage is that one cable pair, which can be used in alter nating mode is sufficient for emission and receipt.

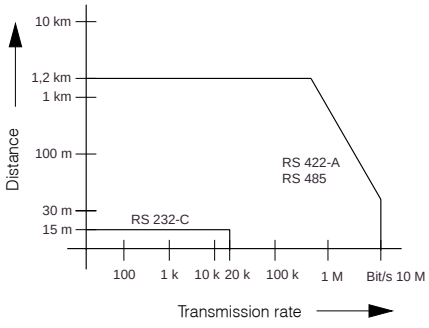
A galvanic separation of the emission/receipt components is highly recommended, to stay unaffected by potential shifts (which cannot avoided with larger distances). A termination is generally necessar y, independent of data rate and distance.

Main characteristics of RS 485 interfaces are:
- long cable length
- high data rates
- basis for bus systems

Chart: Comparison of important interface data

Interfaces	**RS 232 C**	**RS 422 A**	**RS 485**
Transmission	asym.	symmetr.	symmetr.
Number of drivers	1	1	32
Number of receivers	1	10	32
Transmission distance	15 m	1200 m	1200 m
max. transmission rate	20 Kbit/s	12 Mbit/s	12 Mbit/s
Emitter			
Permissible driver output voltage	±25 V	-0.25…6 V	-7…12 V
Driver output signal			
- without load	±15 V	±5 V	±5 V
- with load	±5 V	±2 V	±1.5 V
Receiver			
Input voltage	±15 V	±7 V	-7…12 V
Sensitivity	±3 V	±200 mV	±200 mV

Diagram: Distance –– Transmission rate



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The statements on types, application, use and operating conditions of the sensors and processing systems correspond to the latest information at the time of printing.

Technical data subject to alterations