

WAGO  SYSTEM **750**

## Libraries for Building Automation



### Module Description for Connecting MAGNA and MAGNA3 Series GRUNDFOS Circulation Pumps via GENibus

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We wish to point out that the software and hardware terms, as well as the trademarks of companies used and/or mentioned in the present manual, are generally protected by trademark or patent.

## WAGO-I/O-PRO V2.3 Library for Building Automation

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# Important Notes

To ensure fast installation and start-up of the units, we strongly recommend that the following information and explanations are carefully read and adhered to.

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## Intended Use

For each individual application, the components are supplied from the factory with a dedicated hardware and software configuration. Modifications are only admitted within the framework of the possibilities documented in this document. All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of WAGO Kontakttechnik GmbH & Co. KG.

Please send your requests for modified and new hardware or software configurations directly to WAGO Kontakttechnik GmbH & Co. KG.

## Scope of Validity

This application note is based on the stated hardware and software from the specific manufacturer, as well as the associated documentation. This application note is therefore only valid for the described installation. New hardware and software versions may need to be handled differently.

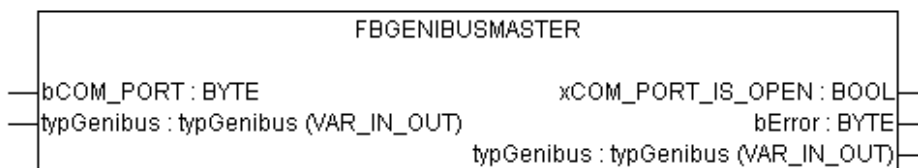
Please note the detailed description in the specific manuals.

# Function blocks

## GENIbus Protocol Master (FbGenibusMaster)

WAGO-I/O-PRO V2.3 Library Elements		
<b>Category:</b>	Building Automation	
<b>Name:</b>	FbGenibusMaster	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>	<b>Data type:</b>	<b>Comment:</b>
bCOM_PORT	BYTE	No. of serial interface used: 1 -> Internal service port 2 -> 1st connected serial module (default) 3 -> 2nd connected serial module
typGenibus	typGenibus	Data structure for the GENIbus protocol
xStart	BOOL	Starts transmission via the serial interface
. xBusy	BOOL	Indicates whether the serial interface is occupied.
. bPrioCmd	BYTE	Number of high priority commands present.
.wNumber	WORD	Indicates the number of logged-in function blocks (POUs), which wish to use the master.
.wCurrent_Pos	WORD	Run index for the transmitting order of the logged-in function blocks
.xComIsOpen	BOOL	Indicates whether the serial interface is available.
.arSendData	ARRAY [0..50] OF BYTE	Data field for the data to be transmitted
.typReciveBuffer	typRING_BUFFER	Data field for the included responses
.iBytesToSend	INT	Number of bytes to be sent from "arSendData"
<b>Return value:</b>	<b>Data type:</b>	<b>Comment:</b>
xCOM_PORT_IS_OPEN	BOOL	TRUE, when the serial interface is ready for operation
bError	BYTE	Error code for the serial interface
typGenibus	typGenibus	Data structure for the GENIbus protocol

**Graphical illustration:**



**Function description:**

The **FbGenibusMaster** function block is used for communication via the RS-485 module 750-652 with the GENIbus protocol.

The address of the serial interface to be used can be set at the "**bCOM\_PORT**" input. The commands are made available in the form of a data table via the variable "typGenibus". The input/output variable "typGenibus" contains all relevant call parameters and data for the GENIbus telegrams received / to be sent.

When the serial interface is ready, the return value "**xCOM\_PORT\_IS\_OPEN**" is TRUE. The error code for the serial interface "**bError**" is output for the return value if there is a communication error.

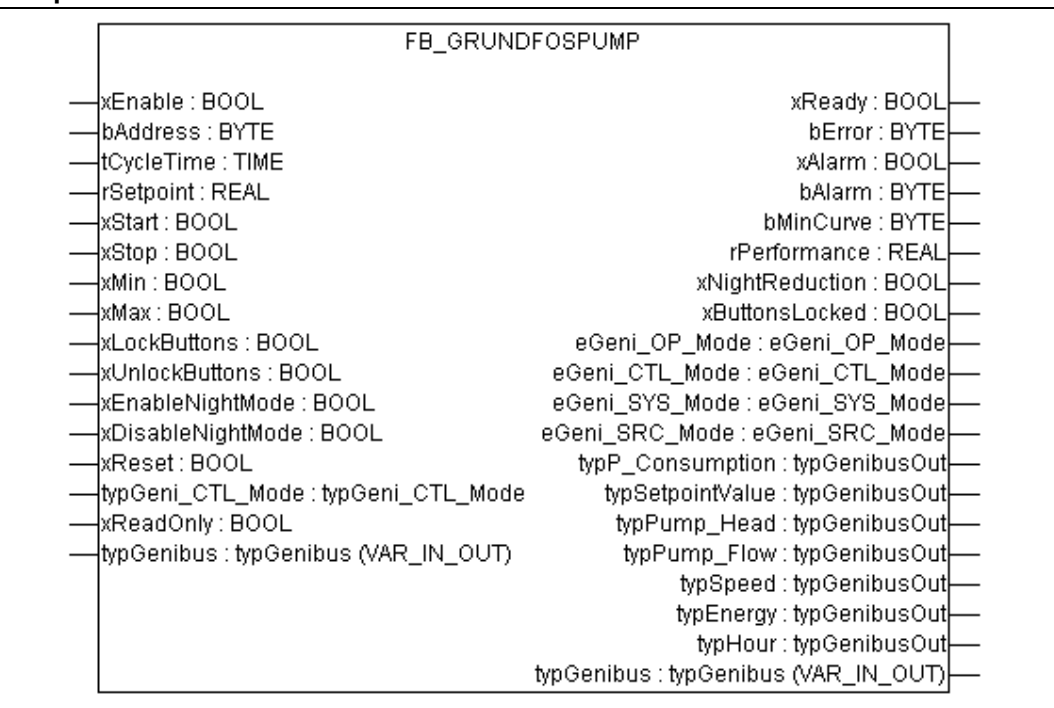
## MAGNA Pumpe Control (Fb\_GrundfosPump)

<b>WAGO-I/O-PRO V2.3 Library Elements</b>		
<b>Category:</b>	Building Automation	
<b>Name:</b>	Fb_GrundfosPump	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>	<b>Data type:</b>	<b>Comment:</b>
xEnable	BOOL	Activates the function block
bAddress	BYTE	Pump address Default setting = 231 Value range: 1 – -32 (231 – 255 %)
tCycleTime	TIME	Time for cyclic polling of the pump Default setting = t#5s
rSetPoint	REAL	Reference variable for the pump
xStart	BOOL	Starts the pump
xStop	BOOL	Stops the pump
xMin	BOOL	Runs the pump at the minimum curve
xMax	BOOL	Runs the pump at the maximum curve
xLockButtons	BOOL	Deactivates manual control of the pump
xUnlockButtons	BOOL	Activates manual control of the pump
xEnableNightMode	BOOL	Activates the Night mode
xDisableNightMode	BOOL	Deactivates the Night mode
xReset	BOOL	Resets all stored alarms
typGeni_CTL_Mode	typGeni_CTL_Mode	Sets the control loop mode for the pump to "eGeni_CTL_Mode" on a rising edge at "xSet"
xReadOnly	BOOL	Activates the "Geni_LOCAL" mode
typGenibus	typGenibus	Data structure for the GENIbus protocol
<b>Return value:</b>	<b>Data type:</b>	<b>Comment:</b>
xReady	BOOL	Status of the communication TRUE = communication complete FALSE = active communication with the pump
bError	BYTE	Indicates a GENIbus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid
xAlarm	BOOL	Indicates that an alarm is present



bAlarm	BYTE	Indicates the alarm code for the pump
bMinCurve	BYTE	Indicates the number for the set minimum curve
rPerformance	REAL	Indicates the output of the pump as a percentage
xNightReduction	BOOL	Night mode active on TRUE
xButtonLocked	BOOL	Manual mode deactivated at the pump on TRUE
eGeni_OP_Mode	eGeni_OP_Mode	Indicates the operating mode: Geni_START = Pump started Geni_STOP = Pump stopped Geni_MIN = Pump set to minimum curve Geni_MAX = Pump set to maximum curve
eGeni_CTL_Mode	eGeni_CTL_Mode	Indicates the control loop mode: Geni_Constant_Pressure = Constant pressure Geni_Proportional_Pressure = Pressure control with proportional pressure Geni_Constant_Frequency = Constant speed Geni_Automatic_Setpoint = Automatic mode
eGeni_SYS_Mode	eGeni_SYS_Mode	Indicates the error mode: Geni_NORMAL = Normal operation Geni_SURVIVE = Survival mode Geni_ALARM_STANDBY = Standby mode
eGeni_SRC_Mode	eGeni_SRC_Mode	Indicates the control mode: Geni_REMOTE = Pump accepting commands via the bus Geni_LOCAL = Pump ignoring commands via the bus, except for "REMOTE"
typP_Consumption	typGenibusOut	Shows power consumption
typSetpointValue	typGenibusOut	Indicates the set reference variable
typPump_Head	typGenibusOut	Indicates possible delivery head
typPump_Flow	typGenibusOut	Indicates the flow rate
typSpeed	typGenibusOut	Indicates the speed
typEnergy	typGenibusOut	Indicates the total amount of energy used
typHour	typGenibusOut	Indicates the operating hours
typGenibus	typGenibus	Data structure for the GENIbus protocol

**Graphical illustration:**



**Function description:**

The **Fb\_GrundfosPump** function block is used for controlling the GRUNDFOS MAGNA circulation pumps via the RS-485 interface (750-652) using the GENIBus protocol.

The bus address for the pump can be given at the **"bAddress"** input. The address range from "1" to "32" that is used corresponds to GENIBus addresses "32" to "63". Address "231" is the factory default setting for the MAGNA pumps. Address "255" is reserved for broadcast messages. The data to be exported are refreshed in the cycle time given by **"tCycleTime"**. The parameter **"xEnable"** starts remote control of the pump. The control mode is indicated by the return value **"eGeni\_SRC\_Mode"**.

The parameter **"rSetpoint"** sets the reference variable. This parameter is interpreted as a percentage of the maximum value for the control loop mode that is set. The value range is between "0.0" and "100.0". The value and the units for the set reference variable can be read from the **"typSetpointValue"** return value. The control loop mode is set via the data structure of the parameter **"typGeni\_CTL\_Mode"**. On a rising edge for **"typGeni\_CTL\_Mode.xSet"**, the mode entered for **"typGeni\_CTL\_Mode.eGeni\_CTL\_Mode"** is activated. Possible modes are "Geni\_Constant\_Pressure" for constant pressure control, "Geni\_Proportional\_Pressure" for proportional pressure control, "Geni\_Constant\_Frequency" for speed control and "Geni\_Automatic\_Setpoint" automatic control. The return value **"eGeni\_CTL\_Mode"** indicates which mode is active.

You can set the operating mode for the pump using the parameters **"xStart"**, **"xStop"**, **"xMin"** and **"xMax"**. A rising edge at one of the inputs will activate the corresponding operating mode. **"xStop"** deactivates the pump, **"xStart"** activates the pump in the set control loop mode, **"xMin"** runs the pump at the set minimum curve and **"xMax"** runs the pump at the set maximum curve. The set operating mode is indicated by the return value **"eGeni\_OP\_Mode"**. The return value **"bMinCurve"** indicates the minimum setting. The return value **"rPerformance"** indicates the current pump output as a percentage. The return values **"typPump\_Head"**, **"typPump\_Flow"**, **"typP\_Consumption"** and **"typSpeed"** provide the current values for delivery head, flow rate, current consumption and speed of the pump. The return values **"typHour"** and **"typEnergy"** signal the hours of operation and energy consumption.

You can activate/deactivate manual control of the pump using the parameters **"xLockButtons"** and **"xUnlockButtons"**. Activation and deactivation of manual control takes place on a rising edge at the corresponding input. The return value **"xButtonsLocked"** indicates deactivation of manual control on "TRUE".

You can activate/deactivate the Night mode using the parameters **"xEnableNightMode"** and **"xDisableNightMode"**. Activation and deactivation of the Night mode takes place on a rising edge at the corresponding parameter. The return value **"xNightReduction"** indicates activation of the Night mode on "TRUE".

The return value **"xAlarm"** indicates whether the pump is reporting an alarm. The alarm code can be read at the return value **"bAlarm"**. An explanation of the alarm code is given in the documentation for the associated pump. On a rising edge at the parameter **"xReset"** the alarm that is present is canceled and the pump is restarted. The return value **"eGeni\_SYS\_Mode"** indicates that the pump has switched to the error mode in reaction to an alarm. Possible modes are **"Geni\_NORMAL"**, **"Geni\_SURVIVE"** and **"Geni\_ALARM\_STANDBY"**.

The input **"xReadOnly"** can be used to set the function block to a read-only operating mode to enable local operation of the pump.

The **"xReady"** output signals whether the function block has completed the transmission process or if it is still connected to the pump.

The data structure **"typGenibus"** combines the **Fb\_GrundfosPump** function block with the **FbGenibusMaster** function block. The control commands to be transmitted for the pump are transferred to the **FbGenibusMaster** module and the responses from the pump are returned via this structure.

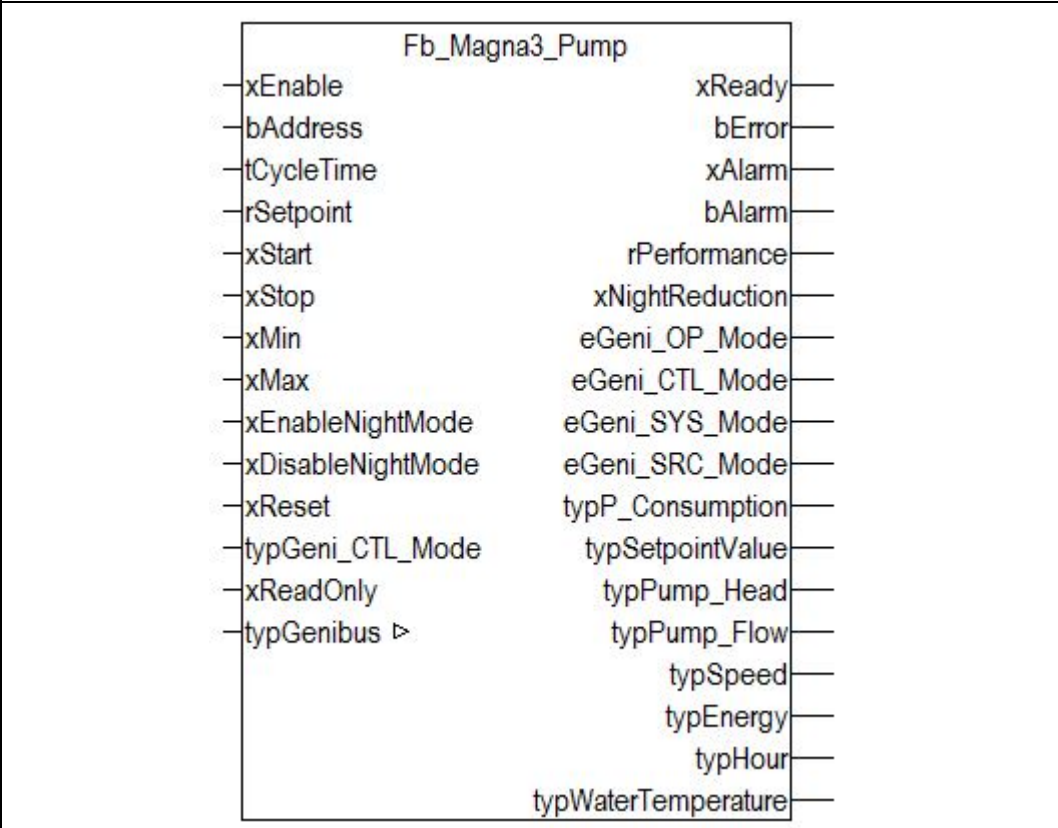
GENibus errors are indicated by the return value **"bError"**.

**MAGNA3 Pumpe Control (Fb\_GrundfosPump)**

<b>WAGO-I/O-PRO V2.3 Library Elements</b>		
<b>Category:</b>	Building Automation	
<b>Name:</b>	Fb_Magna3_Pump	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xEnable	BOOL	Activates the function block
bAddress	BYTE	Pump address Default setting = 231 Value range: 1 – -32 (231 – 255 %)
tCycleTime	TIME	Time for cyclic polling of the pump Default setting = t#5s
rSetPoint	REAL	Reference variable for the pump
xStart	BOOL	Starts the pump
xStop	BOOL	Stops the pump
xMin	BOOL	Runs the pump at the minimum curve
xMax	BOOL	Runs the pump at the maximum curve
xEnableNightMode	BOOL	Activates the Night mode
xDisableNightMode	BOOL	Deactivates the Night mode
xReset	BOOL	Resets all stored alarms
typGeni_CTL_Mode	typGeni_CTL_Mode	Sets the control loop mode for the pump to "eGeni_CTL_Mode" on a rising edge at "xSet"
xReadOnly	BOOL	Activates the "Geni_LOCAL" mode
typGenibus	typGenibus	Data structure for the GENIbus protocol
<b>Return value:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xReady	BOOL	Status of the communication TRUE = communication complete FALSE = active communication with the pump
bError	BYTE	Indicates a GENIbus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid
xAlarm	BOOL	Indicates that an alarm is present
bAlarm	BYTE	Indicates the alarm code for the pump

rPerformance	REAL	Indicates the output of the pump as a percentage
xNightReduction	BOOL	Night mode active on TRUE
eGeni_OP_Mode	eGeni_OP_Mode	Indicates the operating mode: Geni_START = Pump started Geni_STOP = Pump stopped Geni_MIN = Pump set to minimum curve Geni_MAX = Pump set to maximum curve
eGeni_CTL_Mode	eGeni_CTL_Mode	Indicates the control loop mode: Geni_Constant_Pressure = Constant pressure Geni_Proportional_Pressure = Pressure control with proportional pressure Geni_Constant_Frequency = Constant speed Geni_Automatic_Setpoint = Automatic mode
eGeni_SYS_Mode	eGeni_SYS_Mode	Indicates the error mode: Geni_NORMAL = Normal operation Geni_SURVIVE = Survival mode Geni_ALARM_STANDBY = Standby mode
eGeni_SRC_Mode	eGeni_SRC_Mode	Indicates the control mode: Geni_REMOTE = Pump accepting commands via the bus Geni_LOCAL = Pump ignoring commands via the bus, except for "REMOTE"
typP_Consumption	typGenibusOut	Shows power consumption
typSetpointValue	typGenibusOut	Indicates the set reference variable
typPump_Head	typGenibusOut	Indicates possible delivery head
typPump_Flow	typGenibusOut	Indicates the flow rate
typSpeed	typGenibusOut	Indicates the speed
typEnergy	typGenibusOut	Indicates the total amount of energy used
typHour	typGenibusOut	Indicates the operating hours
typWaterTemperature	typGenibusOut	Indicates the water temperature

**Graphical illustration:**

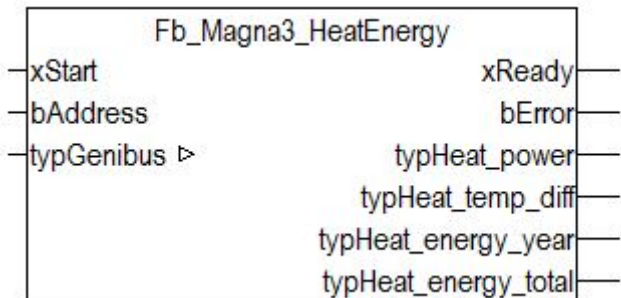


**Function description:**

The **Fb\_Magna3\_Pump** function block is used for controlling the GRUNDFOS MAGNA3 circulation pumps via the RS-485 interface (750-652) using the GENIbus protocol.

Further description see: MAGNA Pumpe Control (Fb\_GrundfosPump)

## MAGNA3 Heat Energy Meter Function ni\_Get\_MeasuredData)

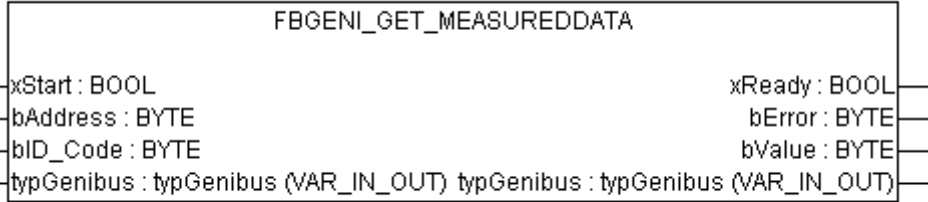
WAGO-I/O-PRO V2.3 Library Elements		
<b>Category:</b>	Building Automation	
<b>Name:</b>	Fb_Magna3_HeatEnergy	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>	<b>Data type:</b>	<b>Comment:</b>
xStart	BOOL	Starts the command on a rising edge
bAddress	BYTE	Address of the GENibus slave
typGenibus	typGenibus	Data structure for the GENibus protocol
<b>Return value:</b>	<b>Data type:</b>	<b>Comment:</b>
xReady	BOOL	Indicates that the module has executed its operations and is ready
bError	BYTE	Indicates a GENibus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid
typHeat_power	typGenibusOut	Current heat power
typHeat_temp_diff	typGenibusOut	Numerical value of differential temperature between forward pipe temperature and return pipe temperature
typHeat_energy_year	typGenibusOut	Accumulated heat energy last year
typHeat_energy_total	typGenibusOut	Accumulated heat energy in total pump life time
<b>Graphical illustration:</b>		
		

**Function description:**

The MAGNA3 has an integrated heat energy meter function. The function block **Fb\_Magna3\_HeatEnergy** is used to read data provided by heat energy meter. The read command is set by a rising edge at the "**xStart**" input



## Get Measured Data (1 Byte) (FbGeni\_Get\_MeasuredData)

WAGO-I/O-PRO V2.3 Library Elements		
<b>Category:</b>	Building Automation	
<b>Name:</b>	FbGeni_Get_MeasuredData	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xStart	BOOL	Starts the command on a rising edge
bAddress	BYTE	Address of the GENIbus slave
bID_Code	BYTE	ID number of the data object to be read
typGenibus	typGenibus	Data structure for the GENIbus protocol
<b>Return value:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xReady	BOOL	Indicates that the module has executed its operations and is ready
bError	BYTE	Indicates a GENIbus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid
bValue	BYTE	Provides the fetched data object on error-free communication
typGenibus	typGenibus	Data structure for the GENIbus protocol
<b>Graphical illustration:</b>		
		

**Function description:**

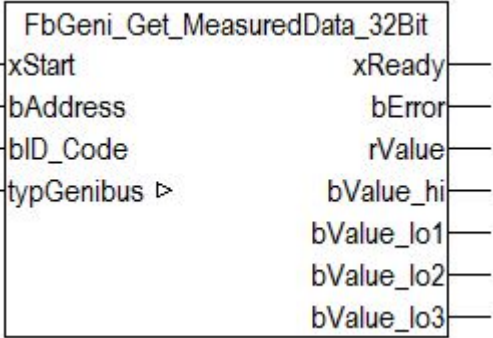
The **FbGeni\_Get\_MeasuredData** function block executes GENIbus GET operations for data class 2. This data class is used for exporting measured data.

The command is set by a rising edge at the "**xStart**" input. During communication with the slave, the return value "**xReady**" has the value "FALSE". This value switches to "TRUE" when communication is concluded. The address for the GENIbus slave is set using "**bAddress**". The GENIbus data object which is to be exported is addressed using "**bid\_Code**". Data exchange takes place via the data structure "**typGenibus**" and assignment of the bus is performed by the **FbGenibusMaster** module. If an error occurs during communication, this is indicated by the return value "**bError**". In the case of error-free communication, the exported data object is at the value for "**bValue**".

**Note!**

A list of commands compatible with MAGNA pumps is given in the appendix under Data Objects of Data Class 2.

## Get Measured Data (4 Byte) (FbGeni\_Get\_MeasuredData\_32Bit)

WAGO-I/O-PRO V2.3 Library Elements		
<b>Category:</b>	Building Automation	
<b>Name:</b>	FbGeni_Get_MeasuredData_32Bit	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>		
	<b>Data type:</b>	<b>Comment:</b>
xStart	BOOL	Starts the command on a rising edge
bAddress	BYTE	Address of the GENibus slave
bID_Code	BYTE	ID number of the data object to be read
typGenibus	typGenibus	Data structure for the GENibus protocol
<b>Return value:</b>		
	<b>Data type:</b>	<b>Comment:</b>
xReady	BOOL	Indicates that the module has executed its operations and is ready
bError	BYTE	Indicates a GENibus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid
rValue	REAL	Output data format REAL
bValue_hi	BYTE	Output data High-Byte
bValue_lo1	BYTE	Output data Low-Byte1
bValue_lo2	BYTE	Output data Low-Byte2
bValue_lo3	BYTE	Output data Low-Byte3
<b>Graphical illustration:</b>		
		

**Function description:**

The **FbGeni\_Get\_MeasuredData\_32Bit** function block executes GENIbus GET operations for data class 14. This data class is used for exporting measured data.

The command is set by a rising edge at the "**xStart**" input. During communication with the slave, the return value "**xReady**" has the value "FALSE". This value switches to "TRUE" when communication is concluded. The address for the GENIbus slave is set using "**bAddress**". The GENIbus data object which is to be exported is addressed using "**bid\_Code**". Data exchange takes place via the data structure "**typGenibus**" and assignment of the bus is performed by the **FbGenibusMaster** module. If an error occurs during communication, this is indicated by the return value "**bError**". In the case of error-free communication, the exported data object is at the value for "**rValue**".

**Note!**

A list of commands compatible with MAGNA3 pumps is given in the appendix under Data Objects of Data Class 14.

## Write Commands (FbGeni\_Set\_Command)

WAGO-I/O-PRO V2.3 Library Elements		
<b>Category:</b>	Building Automation	
<b>Name:</b>	FbGeni_Set_Command	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xStart	BOOL	Starts the command on a rising edge
bAddress	BYTE	Address of the GENIBus slave
bID_Code	BYTE	ID number of the data object to be set
typGenibus	typGenibus	Data structure for the GENIBus protocol
<b>Return value:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xReady	BOOL	Indicates that the module has executed its operations and is ready
bError	BYTE	Indicates a GENIBus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid
typGenibus	typGenibus	Data structure for the GENIBus protocol
<b>Graphical illustration:</b>		
FBGENI_SET_COMMAND		
— xStart : BOOL		xReady : BOOL —
— bAddress : BYTE		bError : BYTE —
— bID_Code : BYTE	typGenibus : typGenibus (VAR_IN_OUT)	—
— typGenibus : typGenibus (VAR_IN_OUT)		

**Function description:**

The **FbGeni\_Set\_Command** function block executes GENIbus SET operations of data class 3. This data class is used for writing GENIbus commands.

The command is set by a rising edge at the "**xStart**" input. During communication with the slave, the return value "**xReady**" has the value "FALSE". This value switches to "TRUE" when communication is concluded. The address for the GENIbus slave is set using "**bAddress**". The GENIbus data object which is to be set is addressed using "**bID\_Code**". Data exchange takes place via the data structure "**typGenibus**" and assignment of the bus is performed by the **FbGenibusMaster** module. If an error occurs during communication, this is indicated by the return value "**bError**".

**Note!**

A list of commands compatible with MAGNA pumps is given in the appendix under Data Objects of Data Class 3.

## Get Configuration Values (FbGeni\_Get\_ConfigValue)

WAGO-I/O-PRO V2.3 Library Elements		
<b>Category:</b>	Building Automation	
<b>Name:</b>	FbGeni_Get_ConfigValue	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xStart	BOOL	Starts the module on a rising edge
bAddress	BYTE	Address of the GENibus slave
bID_Code	BYTE	ID number of the data object to be read
typGenibus	typGenibus	Data structure for the GENibus protocol
<b>Return value:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xReady	BOOL	Indicates that the module has executed its operations and is ready
bError	BYTE	Indicates a GENibus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid
bValue	BYTE	Provides the fetched data object on error-free communication
typGenibus	typGenibus	Data structure for the GENibus protocol
<b>Graphical illustration:</b>		
FBGENI_GET_CONFIGVALUE		
— xStart : BOOL		xReady : BOOL —
— bAddress : BYTE		bError : BYTE —
— bID_Code : BYTE		bValue : BYTE —
— typGenibus : typGenibus (VAR_IN_OUT)	typGenibus : typGenibus (VAR_IN_OUT)	—

**Function description:**

The **FbGeni\_Get\_ConfigValue** function block executes GENIbus GET operations of data class 4. This data class is used for exporting configuration values.

The command is set by a rising edge at the "**xStart**" input. During communication with the slave, the return value "**xReady**" has the value "FALSE". This value switches to "TRUE" when communication is concluded. The address for the GENIbus slave is set using "**bAddress**". The GENIbus data object which is to be exported is addressed using "**bid\_Code**". Data exchange takes place via the data structure "**typGenibus**" and assignment of the bus is performed by the **FbGenibusMaster** module. If an error occurs during communication, this is indicated by the return value "**bError**". In the case of error-free communication, the exported data object is at the value for "**bValue**".

**Note!**

A list of commands compatible with MAGNA pumps is given in the appendix under Data Objects of Data Class 4.



## Set Configuration Values (FbGeni\_Set\_ConfigValue)

WAGO-I/O-PRO V2.3 Library Elements				
<b>Category:</b>	Building Automation			
<b>Name:</b>	FbGeni_Set_ConfigValue			
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>		
<b>Name of library:</b>	Genibus_01.lib			
<b>Applicable to:</b>	See Release Note			
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.			
<b>Input parameter:</b>	<b>Data type:</b>	<b>Comment:</b>		
xStart	BOOL	Starts the module on a rising edge		
bAddress	BYTE	Address of the GENibus slave		
bID_Code	BYTE	ID number of the data object to be set		
bValue	BYTE	Value of the data object to be set		
typGenibus	typGenibus	Data structure for the GENibus protocol		
<b>Return value:</b>	<b>Data type:</b>	<b>Comment:</b>		
xReady	BOOL	Indicates that the module has executed its operations and is ready		
bError	BYTE	Indicates a GENibus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid		
typGenibus	typGenibus	Data structure for the GENibus protocol		
<b>Graphical illustration:</b>				
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p style="text-align: center;">FBGENI_SET_CONFIGVALUE</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding-right: 5px;">           — xStart : BOOL            — bAddress : BYTE            — bID_Code : BYTE            — bValue : BYTE            — typGenibus : typGenibus (VAR_IN_OUT)         </td> <td style="width: 50%; padding-left: 5px;">           xReady : BOOL            bError : BYTE            typGenibus : typGenibus (VAR_IN_OUT)         </td> </tr> </table> </div>			— xStart : BOOL — bAddress : BYTE — bID_Code : BYTE — bValue : BYTE — typGenibus : typGenibus (VAR_IN_OUT)	xReady : BOOL bError : BYTE typGenibus : typGenibus (VAR_IN_OUT)
— xStart : BOOL — bAddress : BYTE — bID_Code : BYTE — bValue : BYTE — typGenibus : typGenibus (VAR_IN_OUT)	xReady : BOOL bError : BYTE typGenibus : typGenibus (VAR_IN_OUT)			

**Function description:**

The **FbGeni\_Set\_ConfigValue** function block executes GENIbus SET operations of data class 4. This data class is used for setting configuration values.

The command is set by a rising edge at the "**xStart**" input. During communication with the slave, the return value "**xReady**" has the value "FALSE". This value switches to "TRUE" when communication is concluded. The address for the GENIbus slave is set using "**bAddress**". The GENIbus data object which is to be set is addressed using "**bID\_Code**". The value to which the data object is to be set is given by the parameter "**bValue**". Data exchange takes place via the data structure "**typGenibus**" and assignment of the bus is performed by the **FbGenibusMaster** module. If an error occurs during communication, this is indicated by the return value "**bError**". In the case of error-free communication, the addressed data object is set to the value for "**bValue**".

**Note!**

A list of commands compatible with MAGNA pumps is given in the appendix under Data Objects of Data Class 4.

## Get Reference Values (FbGeni\_Get\_ReferenceValue)

WAGO-I/O-PRO V2.3 Library Elements		
<b>Category:</b>	Building Automation	
<b>Name:</b>	FbGeni_Get_ReferenceValue	
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
<b>Name of library:</b>	Genibus_01.lib	
<b>Applicable to:</b>	See Release Note	
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.	
<b>Input parameter:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xStart	BOOL	Starts the module on a rising edge
bAddress	BYTE	Address of the GENibus slave
bID_Code	BYTE	ID number of the data object to be read
typGenibus	typGenibus	Data structure for the GENibus protocol
<b>Return value:</b>		
<b>Data type:</b>	<b>Comment:</b>	
xReady	BOOL	Indicates that the module has executed its operations and is ready
bError	BYTE	Indicates a GENibus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid
bValue	BYTE	Provides the fetched data object on error-free communication
typGenibus	typGenibus	Data structure for the GENibus protocol
<b>Graphical illustration:</b>		
FBGENI_GET_REFERENCEVALUE		
— xStart : BOOL		xReady : BOOL —
— bAddress : BYTE		bError : BYTE —
— bID_Code : BYTE		bValue : BYTE —
— typGenibus : typGenibus (VAR_IN_OUT)	typGenibus : typGenibus (VAR_IN_OUT)	—

**Function description:**

The **FbGeni\_Get\_ReferenceValue** function block executes GENIbus GET operations for data class 5. This data class is used for exporting reference variables.

The command is set by a rising edge at the "**xStart**" input. During communication with the slave, the return value "**xReady**" has the value "FALSE". This value switches to "TRUE" when communication is concluded. The address for the GENIbus slave is set using "**bAddress**". The GENIbus data object which is to be exported is addressed using "**bid\_Code**". Data exchange takes place via the data structure "**typGenibus**" and assignment of the bus is performed by the **FbGenibusMaster** module. If an error occurs during communication, this is indicated by the return value "**bError**". In the case of error-free communication, the exported data object is at the value for "**bValue**".

**Note!**

A list of commands compatible with MAGNA pumps is given in the appendix under Data Objects of Data Class 5.

## Set Reference Values (FbGeni\_Set\_ReferenceValue)

WAGO-I/O-PRO V2.3 Library Elements				
<b>Category:</b>	Building Automation			
<b>Name:</b>	FbGeni_Set_ReferenceValue			
<b>Type:</b>	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>		
<b>Name of library:</b>	Genibus_01.lib			
<b>Applicable to:</b>	See Release Note			
<b>Libraries used:</b>	Standard.lib SerComm.lib Serial_Interface_01.lib.			
<b>Input parameter:</b>	<b>Data type:</b>	<b>Comment:</b>		
xStart	BOOL	Starts the module on a rising edge		
bAddress	BYTE	Address of the GENibus slave		
bID_Code	BYTE	ID number of the data object to be set		
bValue	BYTE	Value of the data object to be set		
typGenibus	typGenibus	Data structure for the GENibus protocol		
<b>Return value:</b>	<b>Data type:</b>	<b>Comment:</b>		
xReady	BOOL	Indicates that the module has executed its operations and is ready		
bError	BYTE	Indicates a GENibus error: 0 ACK 1 = CRC error 2 = Timeout 3 = Data class unknown 4 = Data item ID unknown 5 = Operation illegal 6 = Address not valid		
typGenibus	typGenibus	Data structure for the GENibus protocol		
<b>Graphical illustration:</b>				
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p style="text-align: center;">FBGENI_SET_REFERENCEVALUE</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <li>— xStart : BOOL</li> <li>— bAddress : BYTE</li> <li>— bID_Code : BYTE</li> <li>— bValue : BYTE</li> <li>— typGenibus : typGenibus (VAR_IN_OUT)</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <li>xReady : BOOL</li> <li>bError : BYTE</li> <li>typGenibus : typGenibus (VAR_IN_OUT)</li> </ul> </td> </tr> </table> </div>			<ul style="list-style-type: none"> <li>— xStart : BOOL</li> <li>— bAddress : BYTE</li> <li>— bID_Code : BYTE</li> <li>— bValue : BYTE</li> <li>— typGenibus : typGenibus (VAR_IN_OUT)</li> </ul>	<ul style="list-style-type: none"> <li>xReady : BOOL</li> <li>bError : BYTE</li> <li>typGenibus : typGenibus (VAR_IN_OUT)</li> </ul>
<ul style="list-style-type: none"> <li>— xStart : BOOL</li> <li>— bAddress : BYTE</li> <li>— bID_Code : BYTE</li> <li>— bValue : BYTE</li> <li>— typGenibus : typGenibus (VAR_IN_OUT)</li> </ul>	<ul style="list-style-type: none"> <li>xReady : BOOL</li> <li>bError : BYTE</li> <li>typGenibus : typGenibus (VAR_IN_OUT)</li> </ul>			

**Function description:**

The **FbGeni\_Set\_ReferenceValue** function block executes GENIbus SET operations for data class 5. This data class is used for setting reference variables.

The command is set by a rising edge at the "**xStart**" input. During communication with the slave, the return value "**xReady**" has the value "FALSE". This value switches to "TRUE" when communication is concluded. The address for the GENIbus slave is set using "**bAddress**". The GENIbus data object which is to be set is addressed using "**bID\_Code**". The value to which the data object is to be set is given by the parameter "**bValue**". Data exchange takes place via the data structure "**typGenibus**" and assignment of the bus is performed by the **FbGenibusMaster** module. If an error occurs during communication, this is indicated by the return value "**bError**". In the case of error-free communication, the addressed data object is set to the value for "**bValue**".

**Note!**

A list of commands compatible with MAGNA pumps is given in the appendix under Data Objects of Data Class 5.

# Appendix: GENibus Data Object Lists for MAGNA Pumps

## Data Objects of Data Class 2

Data object	ID	Scale	Access	Description
t_2hour_hi	24	INFO	R	Operating hours (2 bytes hi/lo)
t_2hour_lo	25	&LO	R	
i_dc	26	INFO	R	Current rating DC at frequency converter
v_dc	27	INFO	R	DC voltage at frequency converter
t_e	28	INFO	R	Temperature of control system electronics
t_m	29	INFO	R	Temperature of motor, or of the frequency converter
i_mo	30	INFO	R	Motor current
i_line	31	INFO	R	Supply current
f_act	32	100% / 254	R	Control signal (speed or voltage) at the pump
P =	34	INFO	R	Power consumption
<speed>:	35	INFO	R	Speed
"H"	37	INFO	R	Delivery head
q	39	INFO	R	Flow rate
ref_loc	40	INFO	R	Reference variable for "Geni_LOCAL" mode
p_max	41	INFO	R	Maximum power consumption
q_kn1	42	INFO	R	Minimum flow rate at maximum power consumption
q_max	43	INFO	R	Maximum flow rate at maximum power consumption
h_max	44	INFO	R	Maximum delivery head (valve closed)
ind_alarm_bak	46	Bits	R	Backup of the alarm byte only for indicating alarms
led_contr	47	Bits	R	Status of red and green indicator lamps
ref_act	48	INFO	R	Set reference variable (ref_loc or ref_rem)
ref_inf	49	100% / 254	R	Influence of reference variable
t_w	58	INFO	R	Water temperature
ref_att_loc	61	100% / 254	R	Dämpfunggröße des

				„Geni_LOCAL“-Modus
sys_ref	62	INFO	R	Calculated control loop reference variable (ref_act and ref_att_loc or ref_att_rem)
start_alarm1	64	Bits	R	Alarm byte 1 for alarms which prevent switch-on of the pump.
start_alarm2	65	Bits	R	Alarm byte 2 for alarms which prevent switch-on of the pump.
qsd_alarm1	66	Bits	R	Alarm byte 1 for alarms which initiate emergency shutdown of the pump.
qsd_alarm2	67	Bits	R	Alarm byte 2 for alarms which initiate emergency shutdown of the pump.
stop_alarm1	68	Bits	R	Alarm byte 1 for alarms which initiate shutdown of the pump.
stop_alarm2	69	Bits	R	Alarm byte 2 for alarms which initiate shutdown of the pump.
surv_alarm1	70	Bits	R	Alarm byte 1 for alarms which initiate switchover of the pump to the Survival mode.
surv_alarm2	71	Bits	R	Alarm byte 2 for alarms which initiate switchover of the pump to the Survival mode.
ind_alarm	72	Bits	R	Alarm byte for indicating alarms only
start_alarm1_bak	73	Bits	R	Backup of alarm byte 1 for alarms which prevent switch-on of the pump.
start_alarm2_bak	74	Bits	R	Backup of alarm byte 2 for alarms which prevent switch-on of the pump.
qsd_alarm1_bak	75	Bits	R	Backup of alarm byte 1 for alarms which initiate emergency shutdown of the pump
qsd_alarm2_bak	76	Bits	R	Backup of alarm byte 2 for alarms which initiate emergency shutdown of the pump
stop_alarm1_bak	77	Bits	R	Backup of alarm byte 1 for alarms which initiate shutdown of the pump
stop_alarm2_bak	78	Bits	R	Backup of alarm byte 2 for alarms which initiate shutdown of the pump
surv_alarm1_bak	79	Bits	R	Backup alarm byte 1 for alarms which initiate switchover of the pump to the Survival mode.
surv_alarm2_bak	80	Bits	R	Backup of alarm byte 1 for



				alarms which initiate switchover of the pump to the Survival mode.
act_mode1	81	Bits	R	Status byte 1 for the set mode
act_mode2	82	Bits	R	Status byte 2 for the set mode
act_mode3	83	Bits	R	Status byte 3 for the set mode
loc_setup1	85	Bits	R	Settings for the "Geni_LOCAL" mode
rem_setup1	87	Bits	R	Settings for the "Geni_REMOTE" mode
extern_inputs	89	Bits	R	Logical value of all external control input
contr_source	90	Bits	R	Currently set control source and priority
stop_alarm3	93	Bits	R	Alarm byte 3 for alarms which initiate emergency shutdown of the pump.
stop_alarm3_bak	96	Bits	R	Backup of alarm byte 3 for alarms which initiate shutdown of the pump
curve_no_ref	97	Unscaled	R	Number for the set control curve
contr_ref	147	Unscaled	R	Control loop reference variable
unit_family	148	Unscaled	R	Device family code
unit_type	149	Unscaled	R	Device type code
unit_version	150	Unscaled	R	Device version number code
energy_hi	152	INFO	R	Total energy consumed (2 bytes hi/lo)
energy_lo	153	&LO	R	
alarm_code_disp	155	Bits	R	Interpreted alarm message
alarm_code	158	Bits	R	Alarm message
alarm_log_1	159	Bits	R	Logged alarm message 1
alarm_log_2	160	Bits	R	Logged alarm message 2
alarm_log_3	161	Bits	R	Logged alarm message 3
alarm_log_4	162	Bits	R	Logged alarm message 4
alarm_log_5	163	Bits	R	Logged alarm message 5
twin_pump_mode	166	Bits	R	Dual pump mode

## Data Objects of Data Class 3

Data object	ID	Scale	Access	Description
RESET	1	-	W	Hardware reset
RESET_ALARM	2	-	W	Canceling of alarm present and restart
USER_BOOT	4	-	W	Resets the pump to the factory

				default settings (pump must be stopped for this)
STOP	5	-	W	Stops the pump ("Geni_STOP")
[Start]	6	-	W	Starts the pump in the set control loop mode ("Geni_START")
REMOTE	7	-	W	Sets the mode to "Geni_REMOTE"
LOCAL	8	-	W	Sets the mode to "Geni_LOCAL"
"RUN"	9	-	W	Test run mode (for in-plant use only)
PROGRAM	10	-	W	Programming mode (for in-plant use only)
CONST_FREQ	22	-	W	Control loop mode "Geni_Constant_Frequency"
PROP_PRESS	23	-	W	Control loop mode "Geni_Proportional_Pressure"
CONST_PRESS	24	-	W	Control loop mode "Geni_Constant_Pressure"
min.	25	-	W	Activates the "Geni_MIN" mode
MAX	26	-	W	Activates the "Geni_MAX" mode
INFLUENCE_E	28	-	W	Activates control for taking influence of temperature into account
INFLUENCE_D	29	-	W	Deactivates control for taking influence of temperature into account
LOCK_KEYS	30	-	W	Inhibits manual control
UNLOCK_KEYS	31	-	W	Unblocks manual control
REF_UP	33	-	W	Increments the reference variable up one step
REF_DOWN	34	-	W	Decrements the reference variable down one step
RESET_HIST	36	-	W	Resets the values "t_2hour" and "energy"
RESET_ALARM_LOG	51	-	W	Clears the alarm memory
AUTOMATIC	52	-	W	Control loop mode "Geni_Automatic_Setpoint"
TWIN_MODE_SPARE	58	-	W	Spare mode with two pumps
TWIN_MODE_ALTERNATE	59	-	W	Alternating mode with two pumps
TWIN_MODE_SYNC	60	-	W	Synchronous mode with two pumps

NIGHT_REDUCTION_E	66	-	W	Activates the Night mode
NIGHT_REDUCTION_D	67	-	W	Deactivates the Night mode

## Data Objects of Data Class 4

Data object	ID	Scale	Access	Description
unit_addr	46	Unscaled	R/W	GENIbus device address
group_addr	47	Unscaled	R/W	GENIbus group address
min_curve_no	74	Unscaled	R/W	Number for the set minimum curve
h_const_ref_min	83	INFO	R/W	Minimum reference variable "Geni_Constant_Pressure" control loop mode
h_const_ref_max	84	INFO	R/W	Maximum reference variable "Geni_Constant_Pressure" control loop mode
h_prop_ref_min	85	INFO	R/W	Minimum reference variable "Geni_Proportional_Pressure" control loop mode
h_prop_ref_max	86	INFO	R/W	Maximum reference variable "Geni_Proportional_Pressure" control loop mode
ref_steps	87	Unscaled	R/W	Number of steps for incrementing/decrementing of reference variable

## Data Objects of Data Class 5

Data object	ID	Scale	Access	Description
ref_rem	1	100% / 254	R/W	Reference variable for "Geni_REMOTE" mode
ref_ir	2	1 – 19, 1 – 10, or 1 – 7	R/W	Calling a preset reference variable for the "Geni_REMOTE" mode
ref_att_rem	19	100% / 254	R/W	Damping ration for the "Geni_REMOTE" mode

## Data Objects of Data Class 14

Data object	ID	Scale	Access	Description
heat_energy_cnt	33	1kWh	R	Accumulated heat energy in total pump life time
heat_energy_cnt_year	34	1 kWh	R	Accumulated heat energy last year.
heat_power	35	1 W	R	Current heat power:
heat_temp_diff	36	INFO	R	Numerical value of differential temperature between forward pipe temperature and return pipe temperature





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