

# TECHNICAL DATA SHEET

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# Table of contents

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<b>About this document .....</b>	<b>4</b>
Validity .....	4
<b>Overview of the building service management system interfaces .....</b>	<b>5</b>
Building management system function.....	5
Integrating the Geberit sanitary flush into a building service management system .....	5
Digital I/O interface .....	7
RS485 interface.....	8
<b>Digital I/O interface.....</b>	<b>10</b>
Characteristics.....	10
Connection specification .....	10
Standby signal .....	11
Flush actuation .....	12
Status display .....	14
Connection examples.....	15
Application examples .....	17
Remote status display .....	17
Activating an external solenoid valve .....	19
<b>RS485 interface .....</b>	<b>21</b>
Characteristics.....	21
Connection diagram .....	21
Communication protocol.....	22
Command and response .....	22
Timing.....	23
Commands .....	23
Start communication.....	24
Activate valves.....	25
Query valve status.....	27
Query sensor values.....	29
Query malfunction .....	30
Reset malfunction.....	33
Query warning .....	35
Reset warning.....	36
Query maintenance interval.....	37
Reset maintenance time .....	38
Send password.....	39
Command sets .....	40
Volume-dependent flush.....	40
Temperature-dependent flush .....	42

# About this document

## Validity

This document contains the technical specifications for the building service management system interfaces of the following products:

Product	Building service management system interfaces	
	Digital I/O	RS485
Geberit sanitary flush	✓	✓
Geberit sanitary flush with volumetric flow rate measurement	✓	✓
Geberit sanitary flush without interfaces	✓	–
Geberit element for wall-hung WC, with Sigma concealed cistern, 12 cm, for sanitary flush	✓	✓
Geberit element for wall-hung WC, with Sigma concealed cistern, 12 cm, for sanitary flush with volumetric flow rate measurement	✓	✓
Geberit element for wall-hung WC, with Sigma concealed cistern, 12 cm, for sanitary flush without interfaces	✓	–

This document applies to the following versions of the Geberit sanitary flush control unit:

Date	Firmware version	Change
01.04.2015	Rev: 00	–
01.12.2015	Rev: 01	<ul style="list-style-type: none"> <li>• “Activate valves” command: elements m and s added</li> <li>• “Query valve status” command: elements y1, y2, z1 and z2 added</li> </ul>
01.10.2017	Rev: 02	<ul style="list-style-type: none"> <li>• Interval of standby signal for digital I/O interface extended to 6 hours</li> <li>• Description of digital I/O interface extended</li> <li>• New version of the Geberit SetApp</li> <li>• “Send password” command added</li> </ul>
01.10.2020	Rev: 03–06	<ul style="list-style-type: none"> <li>• Various hardware amendments</li> </ul>

The firmware version is displayed in the [Overview] menu of the Geberit SetApp:

Overview	
HS 5.3	
Name	HS 5.3
Firmware version	Rev: 03 Tech: 1 SVN: 923
Date	19.03.2020
Time	14:49:37

# Overview of the building service management system interfaces

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## Building management system function

A building management system (BMS) is used to operate, control and monitor technical systems within the building such as:

- heating, ventilation and cooling systems
- lighting and shading systems
- monitoring and access systems

The individual systems include sensors and actuators which are connected via different communication channels to the building management system server. Sensor values (temperature, pressure, humidity, etc.) are queried and actuators (motors, valves, etc.) are actuated according to specific algorithms to control the individual systems.

## Integrating the Geberit sanitary flush into a building service management system

Integrating the Geberit sanitary flush into a building service management system offers the following options:

- central flush actuation for all Geberit sanitary flushes in the building
- time-dependent, temperature-dependent and volume-dependent flush actuations
- logging of the temperature profile and the volume flushed
- signalling and evaluation of error messages

The sanitary flush is equipped with 2 interfaces for connection to a building service management system or a programmable logic controller (PLC).

### Master/slave mode

When the Geberit sanitary flush is integrated into a building service management system via one of the two interfaces, all flushes are controlled by the master building service management system. The sanitary flush is set to slave mode. The flushing programmes defined with the Geberit SetApp are not executed in slave mode.

The building service management system must send a standby signal at regular intervals to enable the building service management system (master) to retain active control of the sanitary flush (slave).

### Limiting the flush time

In slave mode, the Geberit sanitary flush is controlled exclusively by the building service management system. To avoid excessive water consumption, the building service management system must ensure that the following conditions are met:

- For time and volume-dependent flushes, select the flush time so that only the volume of the pipe to be flushed is flushed.
- For temperature-dependent flushes, limit the flush time.

The following must be observed in addition for the Geberit sanitary flush in the concealed cistern:

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## ATTENTION

### Damage to the concealed cistern due to hot water

Prolonged flushing with hot water can damage the concealed cistern. The building service management system must ensure that the following conditions are met:

- ▶ Maximum flush time per day and solenoid valve: 10 minutes
- ▶ Maximum flush volume per day and solenoid valve: 40 litres
- ▶ Minimum flush interval: 24 hours

## Basic settings

The following basic settings cannot be configured via the building service management system. They must always be set with the Geberit SetApp:

- name of the sanitary flush
- solenoid valves open simultaneously [On/Off]
- malfunction buzzer [On/Off]
- date and time
- password protection



Geberit recommends consulting a systems integrator when integrating the Geberit sanitary flush into a building management system.

## Digital I/O interface

The digital I/O interface has 1 unidirectional digital input and 2 unidirectional digital outputs. The digital input is used to open and close the solenoid valves to trigger a flushing process. One digital output indicates the status of the solenoid valves and the other output indicates if there is an error message.

Each Geberit sanitary flush is connected directly to a digital input card of a building service management system (BSMS) or a programmable logic controller (PLC). This requires the cable for digital I/O interface, art. no. 616.206.00.1.

Programmable logic controllers are mainly used for smaller systems.

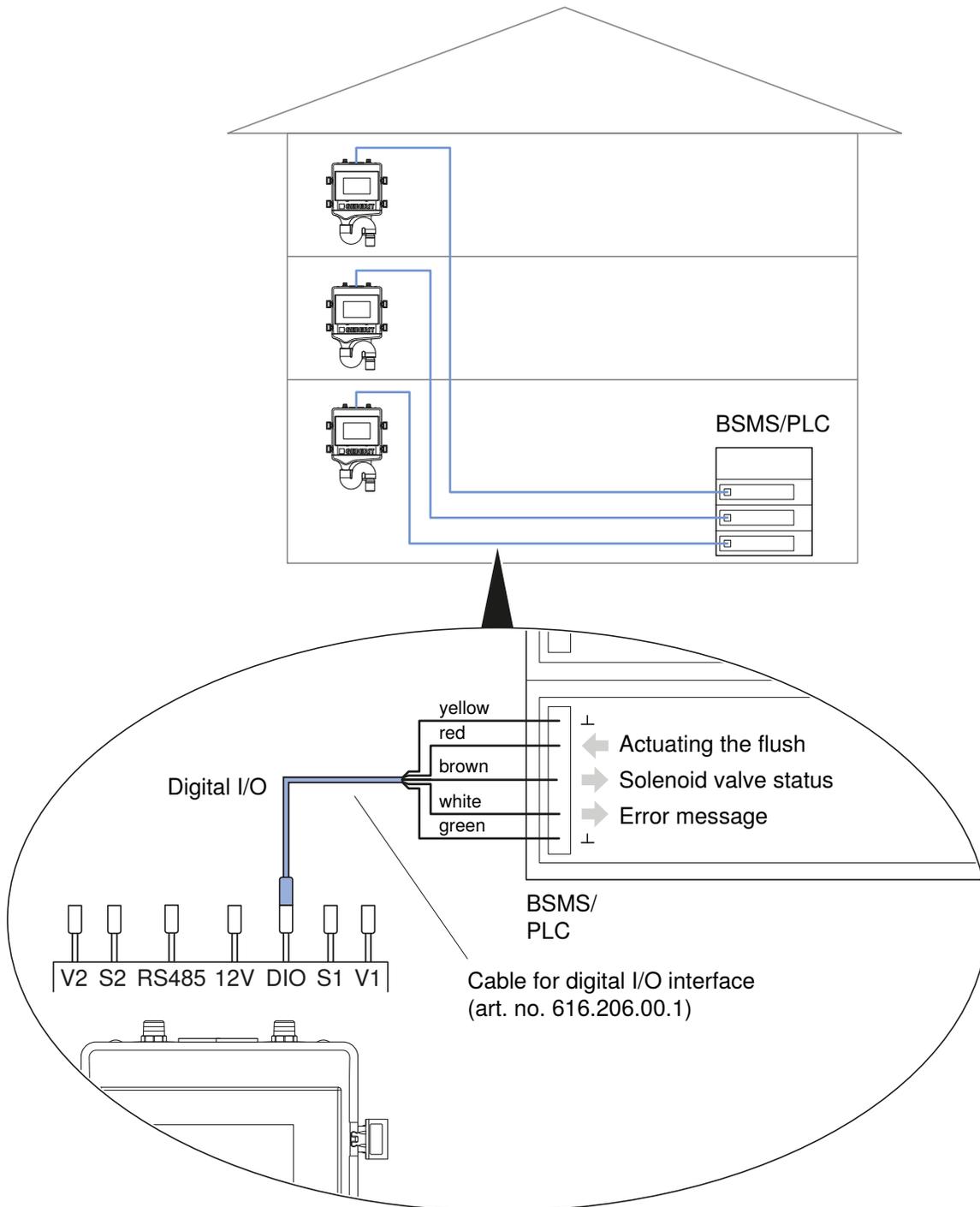
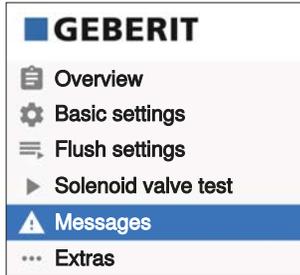


Figure 1: Connecting the digital I/O interface to the building service management system

The digital I/O interface is suitable for systems in which only time-controlled flushing programmes are required. The digital outputs can be used for displaying statuses and errors, and for switching external solenoid valves. The cause of an error message must be read out in the [Messages] menu in the Geberit SetApp:



→ See "Digital I/O interface", page 10 for a detailed description of the interface.

## RS485 interface



The RS485 interface is not available in the case of Geberit sanitary flushes without interfaces.

The RS485 interface is a serial, bidirectional interface for sharing data between Geberit sanitary flushes and a building service management system.

The building service management system can activate flushing processes, query sensor values such as temperature and volumetric flow rate, and signal and evaluate error messages. This allows complex flushing programmes to be implemented by using the building service management system.

Example of a flushing programme for a volume-dependent flush:

1. Open the solenoid valve.
2. Query the current value provided by the volumetric flow rate sensor periodically and compare it with the volume to be flushed.
3. Close the solenoid valve once the volume to be flushed is reached.

Example of a flushing programme for a temperature-dependent flush:

1. Query the current value provided by the temperature sensor periodically and compare it with the setpoint temperature.
2. Open the solenoid valve if the temperature is outside of the permitted range.
3. Query the current value provided by the temperature sensor periodically.
4. Close the solenoid valve once the temperature is within the permitted range again.

## Connecting to the building service management system

Each Geberit sanitary flush is connected to an RS485 input card for the building service management system via the cable for RS485 interface, art. no. 616.205.00.1.

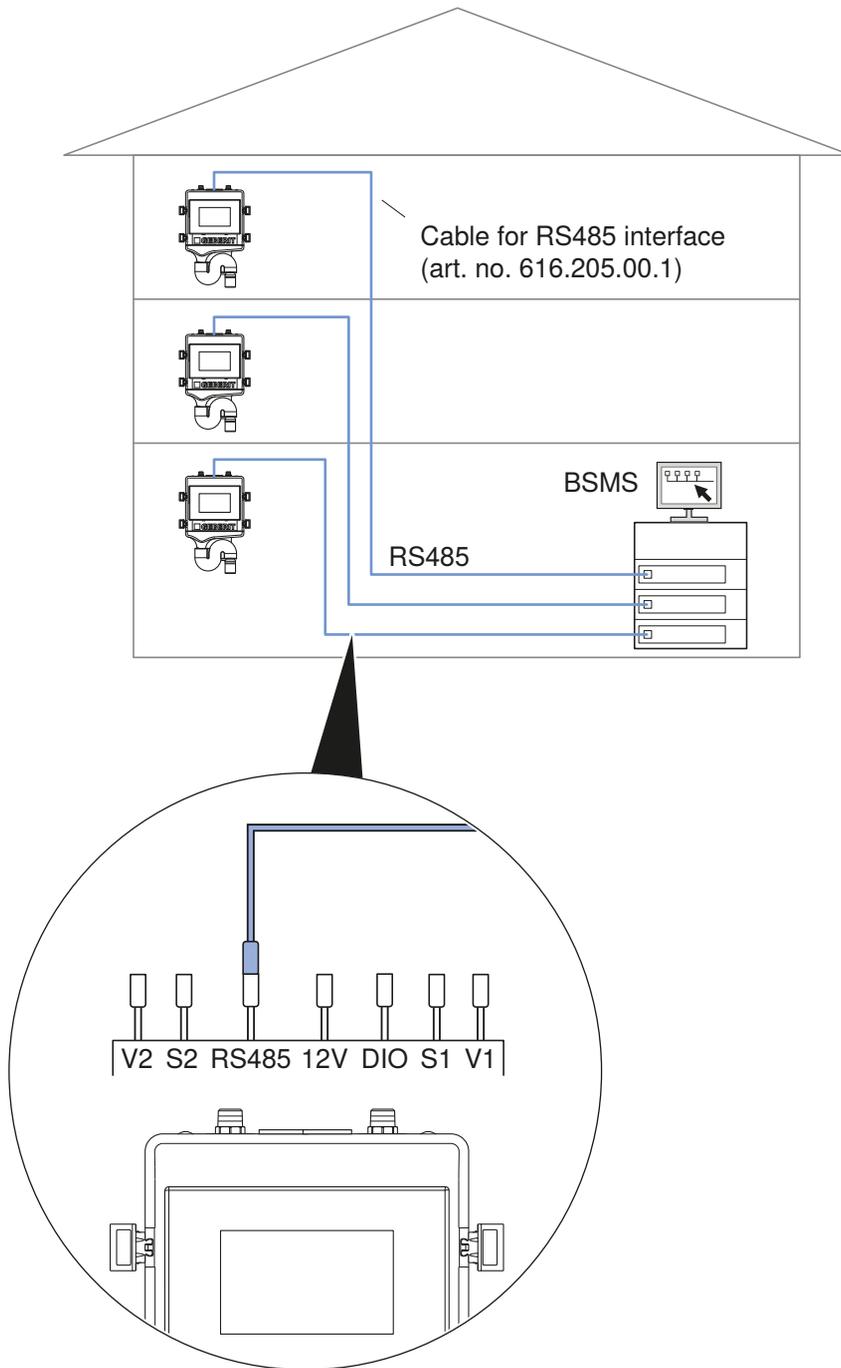


Figure 2: Connecting the RS485 interface to a building service management system  
→ See "RS485 interface", page 21 for a detailed description of the interface.

# Digital I/O interface

## Characteristics

The digital I/O interface has an input for flush actuation. The IN FLUSH START control signal actuates a flush. The control signal comprises the selection of the solenoid valve and the flush time.

The different statuses of the Geberit sanitary flush are signalled via 2 outputs. The OUT FLUSH ACT output signals “Flush active”, while the OUT STATUS OK output signals “Status OK”.

## Connection specification

The Geberit sanitary flush is connected to the building service management system or programmable logic controller via the 5-wire cable for digital I/O interface, art. no. 616.206.00.1.

Table 1: Connection assignment of cable for digital I/O interface

Item no.	Colour	Signal	Function	Type	Characteristics
2	Green	OUT COMMON	Common contact of outputs	–	–
3	White	OUT STATUS OK	“Status OK” signal	Output	Make contact, contact load: $\leq 24 \text{ V DC}, \leq 0.5 \text{ A}$
4	Brown	OUT FLUSH ACT	“Flush active” signal	Output	Make contact, contact load: $\leq 24 \text{ V DC}, \leq 0.5 \text{ A}$
5	Red	IN FLUSH START	Flush actuation	Input	Input signal from PLC: 12–24 V DC, approx. 20 mA
1	Yellow	IN GND	Ground line input	–	–

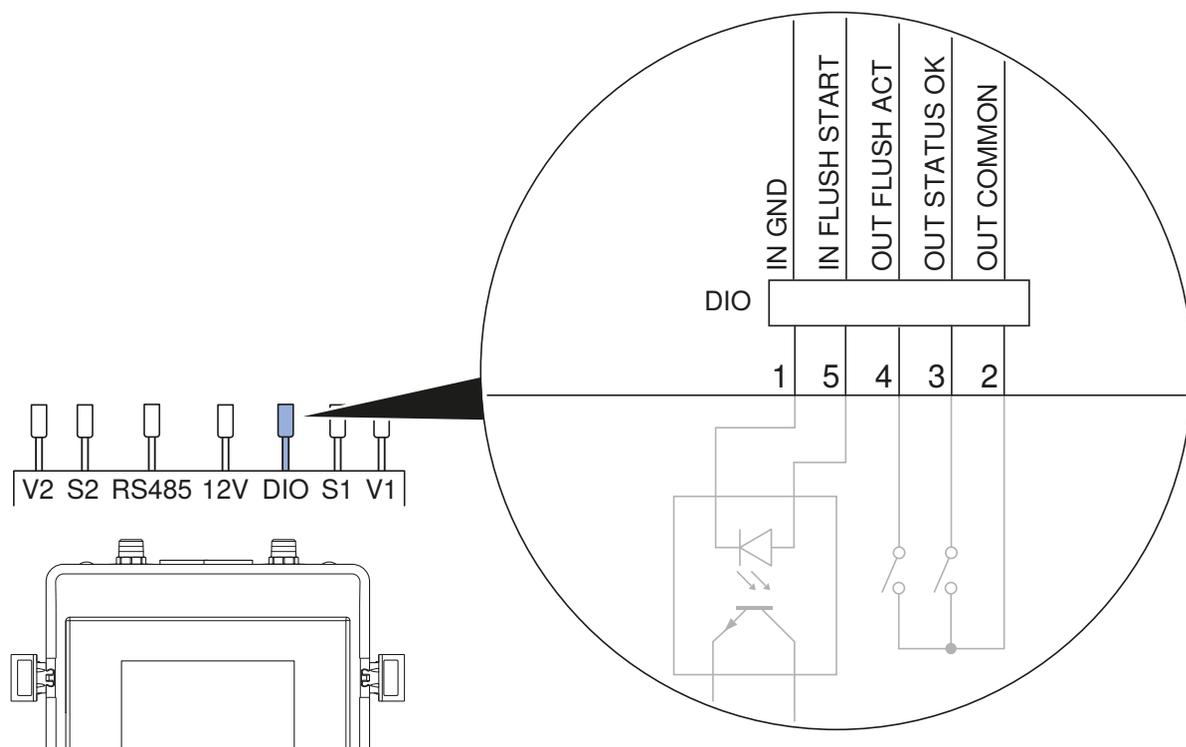


Figure 3: Wiring of digital I/O interface

## Standby signal

The building service management system needs to periodically signal to the Geberit sanitary flush that it is on standby to ensure that the sanitary flush stays in slave mode.

The first standby signal sets the sanitary flush to slave mode. Slave mode is indicated by the green LED on the control unit of the sanitary flush. 2 short flash pulses are repeated every 2 seconds. If the standby signal fails to arrive, slave mode is ended and the sanitary flush once again starts to execute the flushing programmes of the Geberit SetApp as defined in the <Flush settings> menu.

The following conditions apply to the standby signal:

- The standby signal must be sent to the IN FLUSH START input.
- A standby signal or flush signal must be sent at least every 6 hours.
- Following the standby signal, a delay time of > 5 seconds must be observed before a new signal is sent.
- The standby signal consists of 5 pulses and a delay time. → See the figure below.

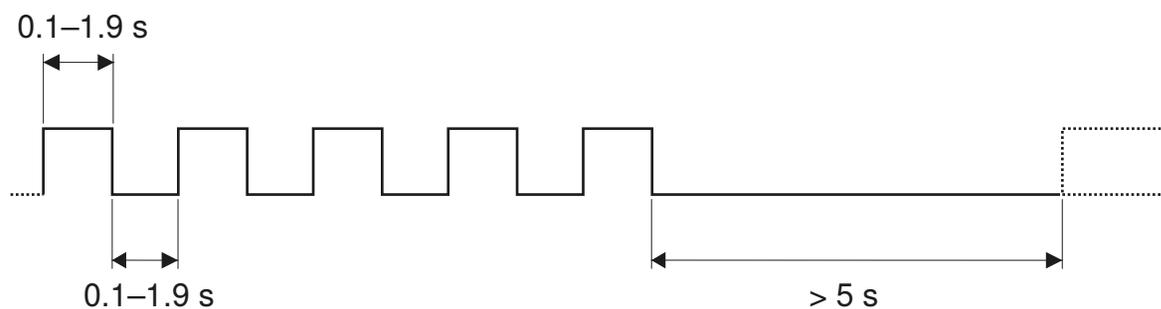


Figure 4: Standby signal of digital I/O interface

## Flush actuation

The flush signal actuates a flush. The flush signal comprises the selection of the solenoid valve and the flush time. The flush signal also acts as the standby signal.

The following conditions apply to the flush signal:

- The flush signal must be sent to the IN FLUSH START input.
- A standby signal must not be sent at the same time.
- The flush signal consists of 3 parts.
  - Part ①: Selection of the solenoid valve based on a specific number of pulses
    - 1 pulse = solenoid valve V1
    - 2 pulses = solenoid valve V2
    - 3 pulses = solenoid valves V1 and V2
  - Part ②: Flush time
    - The selected solenoid valve stays open for as long as the pulse is present.
    - The flush time must be at least 5 seconds and no more than 6 hours. The solenoid valve opens after 5 seconds.
  - Part ③: Delay time
    - Prior to the next command, a delay time of > 5 seconds must be observed.

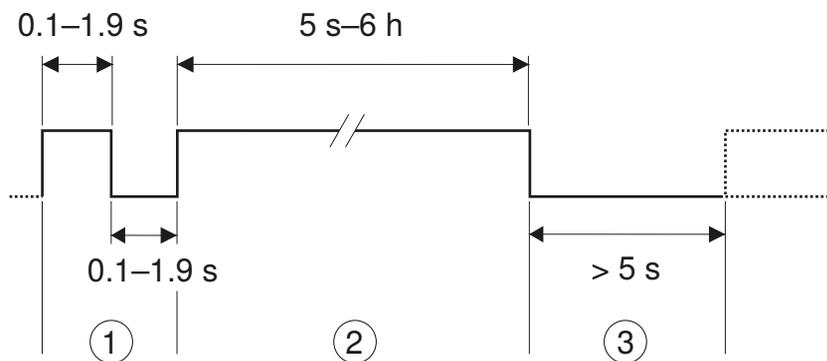


Figure 5: Flush signal for solenoid valve V1

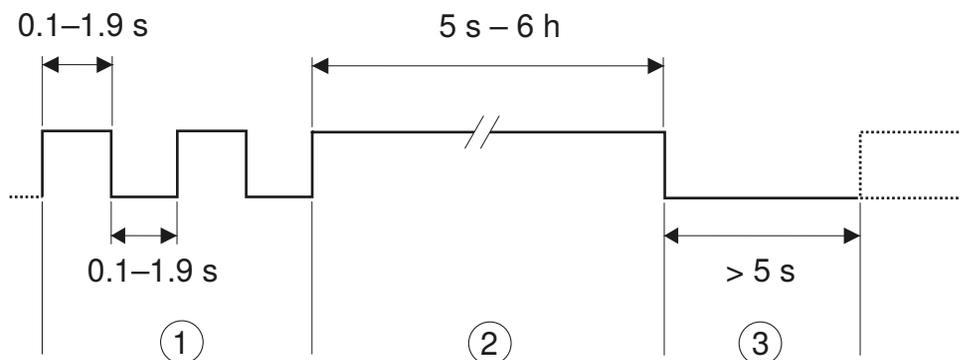


Figure 6: Flush signal for solenoid valve V2

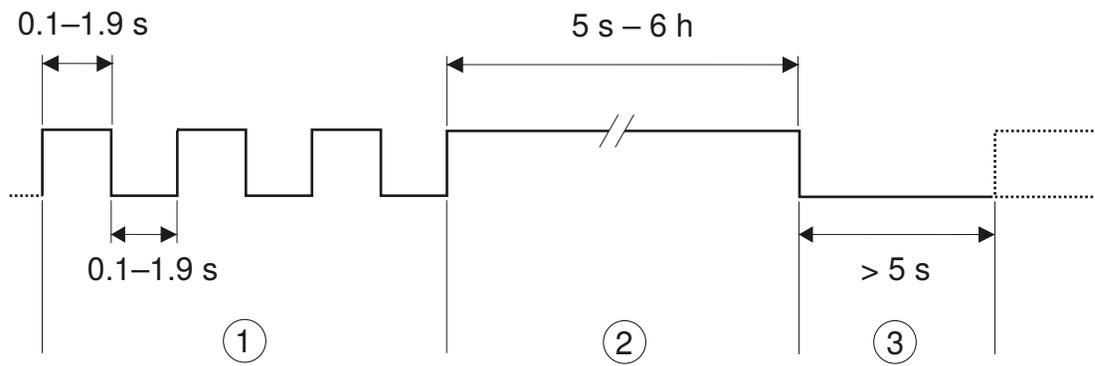


Figure 7: Flush signal for solenoid valves V1 and V2

- ① Solenoid valve selection
- ② Flush time
- ③ Delay time

**Example:**

- Flush actuation: every 12 hours
- Flush time: 5 minutes
- Solenoid valve: V2

The sequence starts with a flush signal ① to actuate the first flush and to set the sanitary flush to slave mode. The standby signal ② is sent before the 6 hours have passed; for example, every 5 hours. The flush signal ① is sent every 12 hours.

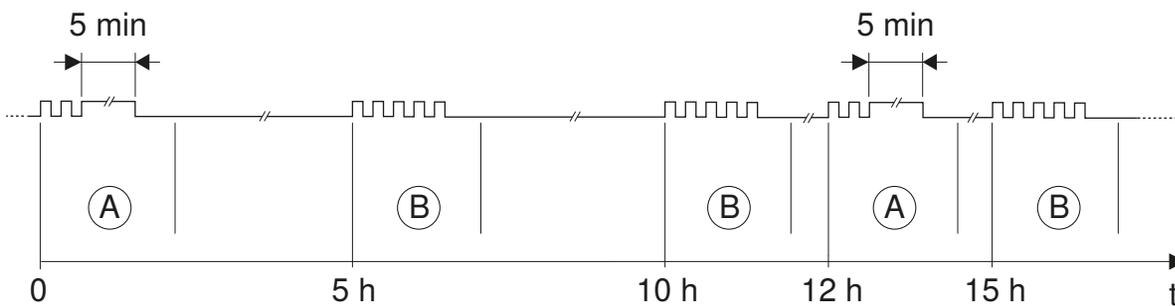


Figure 8: Example of standby and flush signals

The following must be observed in addition for the Geberit sanitary flush in the concealed cistern:

**ATTENTION**

**Damage to the concealed cistern due to hot water**

Prolonged flushing with hot water can damage the concealed cistern. The building service management system must ensure that the following conditions are met:

- ▶ Maximum flush time per day and solenoid valve: 10 minutes
- ▶ Maximum flush volume per day and solenoid valve: 40 litres
- ▶ Minimum flush interval: 24 hours

## Status display

The two outputs indicate the following statuses:

Table 2: Outputs

Signal	Status	Description
OUT STATUS OK	Contact closed	OK, no errors
	Contact open	Error message Query the cause of the error in the <Messages> menu in the Geberit SetApp.
OUT FLUSH ACT	Contact closed	Solenoid valve V1 or V2 open, flush active
	Contact open	Solenoid valves closed, no flush active

The OUT STATUS OK contact only indicates whether an error message is present. The cause of the error must be read out in the <Messages> menu in the Geberit SetApp.

## Connection examples

The following figures show 2 ways of connecting to a programmable logic controller (PLC).

Power is delivered to the PLC via a separate supply (12–24 V DC) that is independent of the power supply for the Geberit sanitary flush.

Variant 1: inputs I1 and I2 are switched to GND when the signal is active (active low).

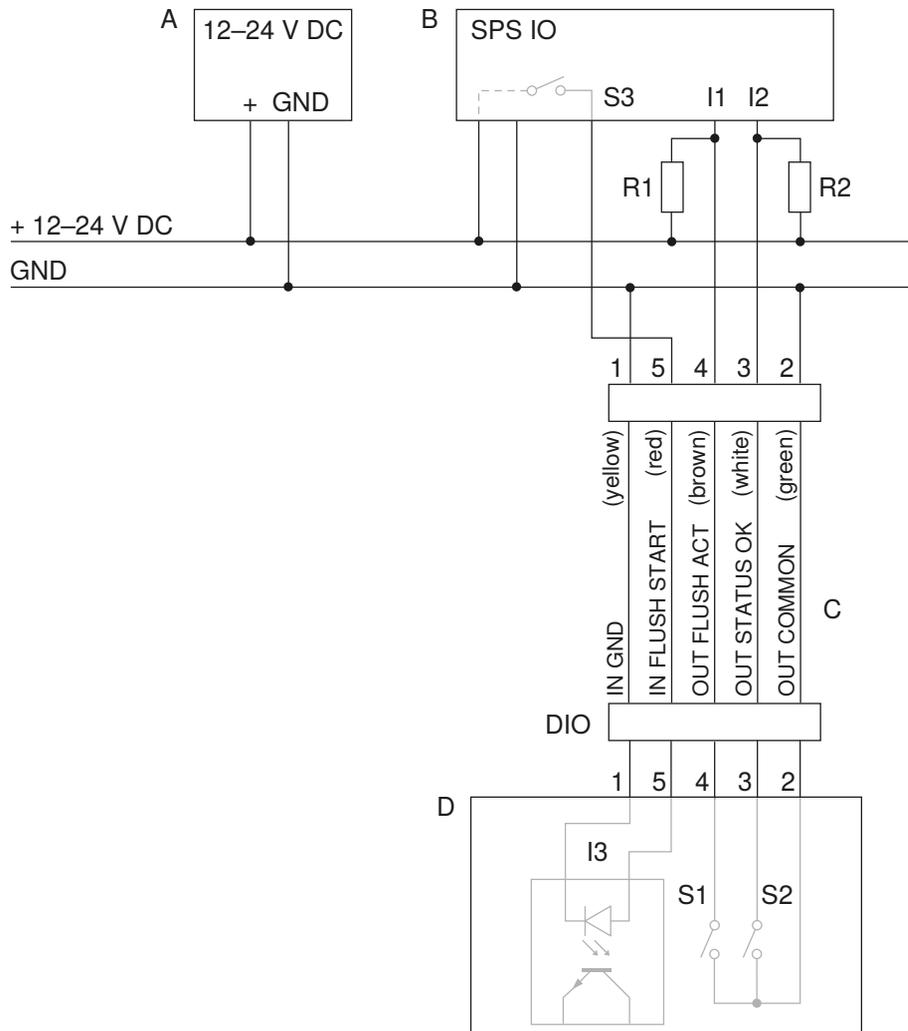


Figure 9: Digital I/O interface connection diagram, variant 1

- A PLC power supply, 12–24 V DC
- B PLC input card with 2 inputs and 1 output
- S3 Output for flush actuation
- I1 Input for “Flush active” signal
- I2 Input for “Status OK” signal
- R1, R2 Pull-up resistors, value defined by PLC, can also be integrated in PLC input card
- C Cable for digital I/O interface, art. no. 616.206.00.1
- D Control unit of the Geberit sanitary flush
- I3 Input for flush actuation (IN FLUSH START), actuated by S3
- S1 Make contact for “Flush active” signal (OUT FLUSH ACT), switches I1 to GND
- S2 Make contact for “Status OK” signal (OUT STATUS OK), switches I2 to GND

Variant 2: inputs I1 and I2 are switched to 12–24 V DC when the signal is active (active high).

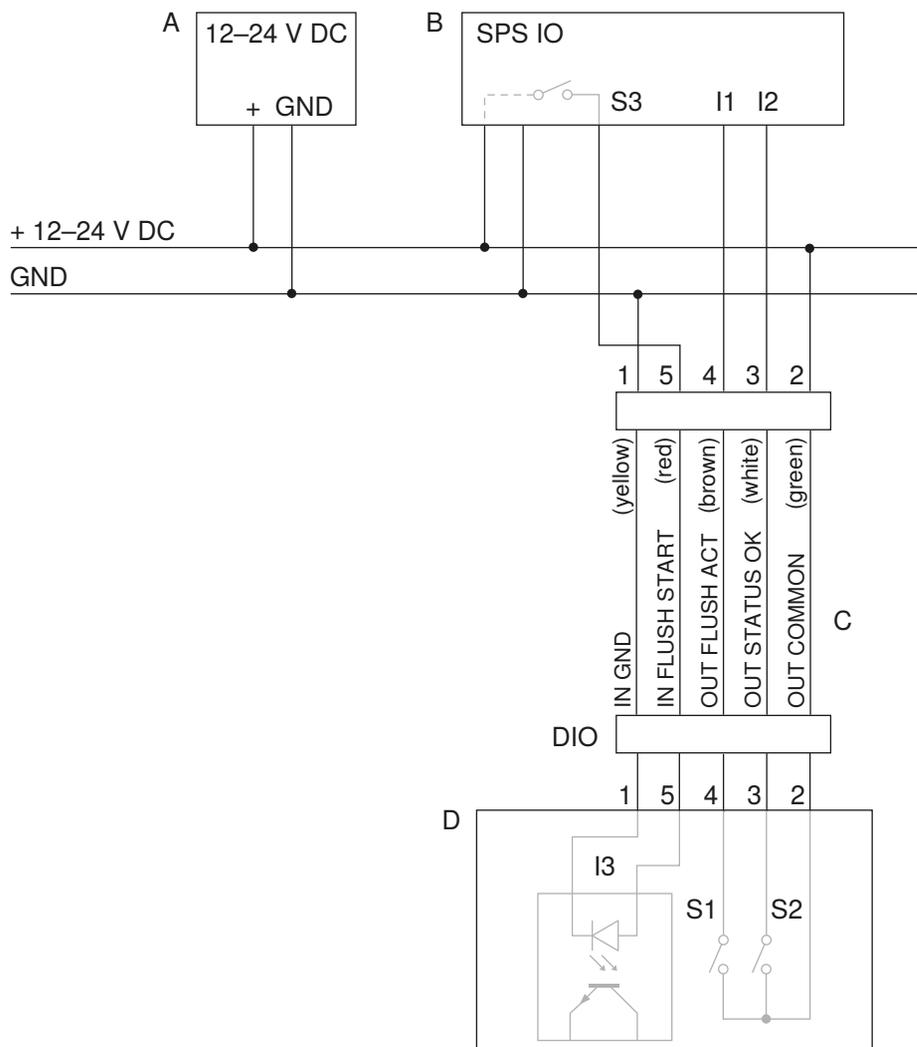


Figure 10: Digital I/O interface connection diagram, variant 2

- A PLC power supply, 12–24 V DC
- B PLC input card with 2 inputs and 1 output
- S3 Output for flush actuation
- I1 Input for “Flush active” signal
- I2 Input for “Status OK” signal
- C Cable for digital I/O interface, art. no. 616.206.00.1
- D Control unit of the Geberit sanitary flush
- I3 Input for flush actuation (IN FLUSH START), actuated by S3
- S1 Make contact for “Flush active” signal (OUT FLUSH ACT), switches I1 to 12–24 V DC
- S2 Make contact for “Status OK” signal (OUT STATUS OK), switches I2 to 12–24 V DC



If possible, use an electronic relay for S3.

If using a mechanical relay, observe the maximum number of switching operations (flush signal and standby signal).

# Application examples

## Remote status display

The two OUT STATUS OK and OUT FLUSH ACT outputs can be used for a remote status display outside the Geberit sanitary flush, even when the sanitary flush is being operated without the building service management system. This means that flushing processes and error messages, for example, can be indicated visually or audibly from a central point.

Without a building service management system, the sanitary flush operates in master mode and executes the flushing programmes of the Geberit SetApp.

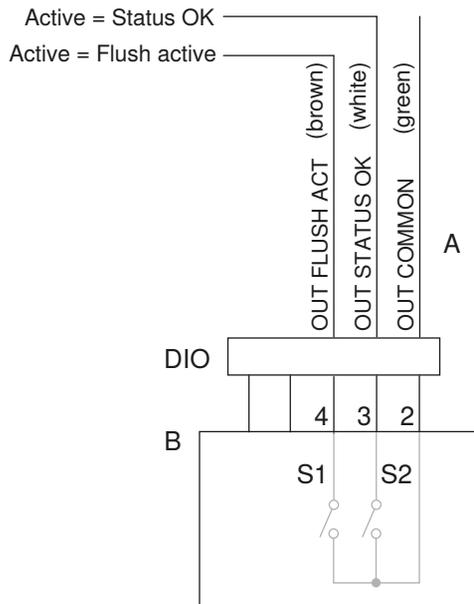


Figure 11: Connection diagram for remote status display

- A Cable for digital I/O interface, art. no. 616.206.00.1
- B Control unit of the Geberit sanitary flush
- S1 Make contact for “Flush active” signal (OUT FLUSH ACT)
- S2 Make contact for “Status OK” signal (OUT STATUS OK)

Table 3: Connection specification for remote status display

Item no.	Colour	Signal	Function	Type	Characteristics
2	Green	OUT COMMON	Common contact of outputs	–	–
3	White	OUT STATUS OK	“Status OK” signal	Output	Make contact, contact load: ≤ 24 V DC, ≤ 0.5 A
4	Brown	OUT FLUSH ACT	“Flush active” signal	Output	Make contact, contact load: ≤ 24 V DC, ≤ 0.5 A

The example below shows a visual and audible status display:

- An open solenoid valve is indicated by a signal lamp. Switch S1 switches on the signal lamp when the solenoid valve opens (“Flush active” signal).
- An error message is indicated by a buzzer. If there is no error (“Status OK” signal), switch S2 closes and the relay interrupts the buzzer electric circuit. If there is an error, switch S2 opens and the relay closes the buzzer electric circuit.

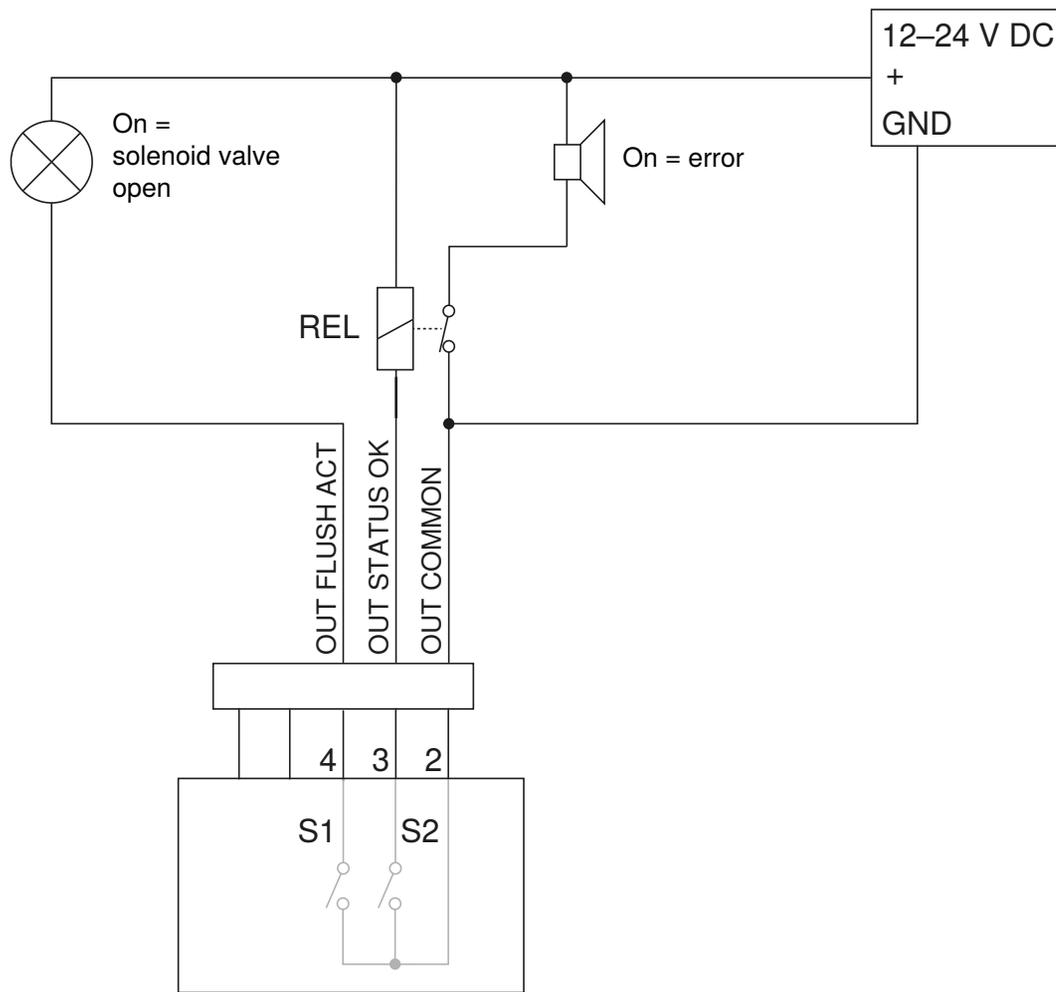


Figure 12: Example of a visual and audible status display

## Activating an external solenoid valve

The OUT FLUSH ACT output can be used to activate an external solenoid valve. The external solenoid valve is opened as soon as solenoid valve V1 or V2 is opened. A solenoid valve that is being used as a floor shut-off valve can be opened at the same time, for example.

The following example shows an external solenoid valve that opens at the same time as internal solenoid valve V1 by means of make contact S1 and a relay.

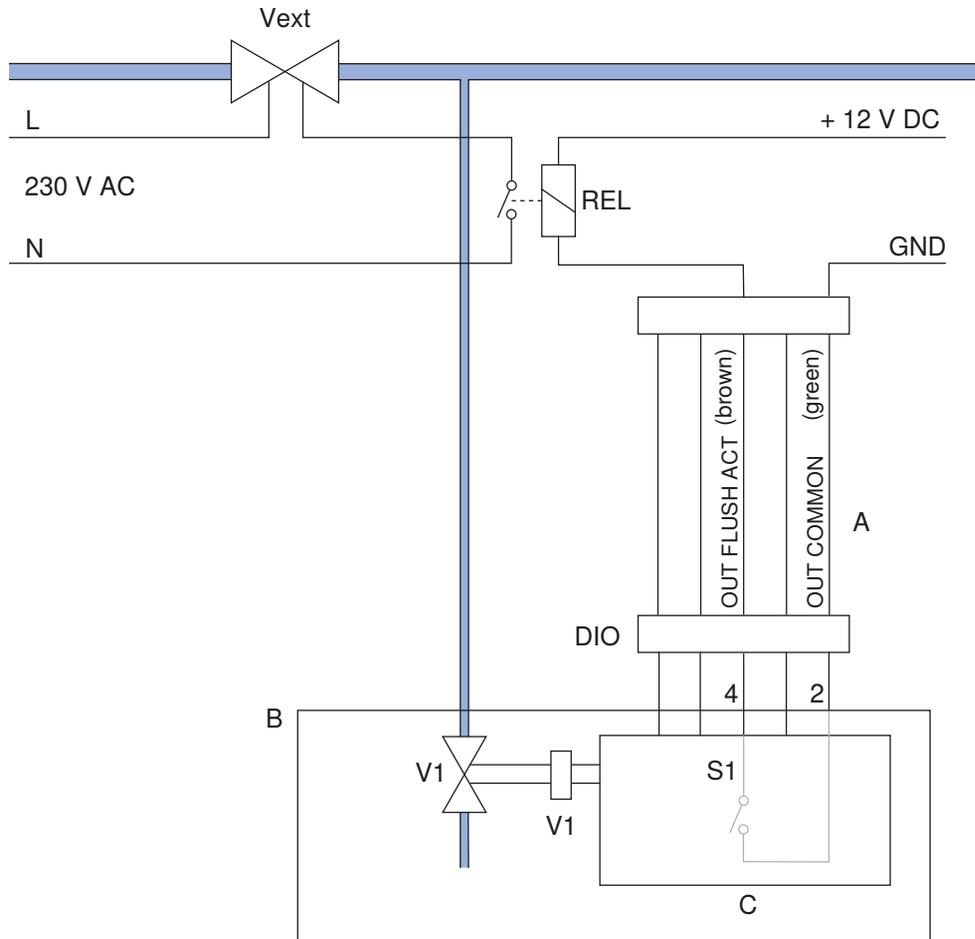


Figure 13: Connection diagram for external solenoid valve

- A Cable for digital I/O interface, art. no. 616.206.00.1
- B Geberit sanitary flush
- C Control unit of the Geberit sanitary flush
- S1 Make contact for “Flush active” signal (OUT FLUSH ACT)
- V1 Internal solenoid valve V1
- REL Relay, 12 V DC
- Vext External solenoid valve, 230 VAC

Table 4: Connection specification for external solenoid valve

Item no.	Colour	Signal	Function	Type	Characteristics
2	Green	OUT COMMON	Common contact of outputs	–	–
4	Brown	OUT FLUSH ACT	“Flush active” signal	Output	Make contact, contact load: ≤ 24 V DC, ≤ 0.5 A

As an alternative, the external solenoid valve can be switched directly via S1. In this case, however, the solenoid valve is permitted to operate at maximum 24 V DC and 0.5 A.

For additional application examples of the digital I/O interface, contact your responsible Geberit sales company.

# RS485 interface

## Characteristics

**i** The RS485 interface is not available in the case of Geberit sanitary flushes without interfaces.

The RS485 interface is a point-to-point interface. This means that each Geberit sanitary flush is connected directly to the building service management system. Bus systems are not possible. The control unit of the Geberit sanitary flush contains a 120 Ω terminal resistor. → See figure below.

Interface parameters:

- UART protocol
- 19,200 baud
- 8 data bits
- no parity
- 1 stop bit
- half-duplex
- ASCII character coding

## Connection diagram

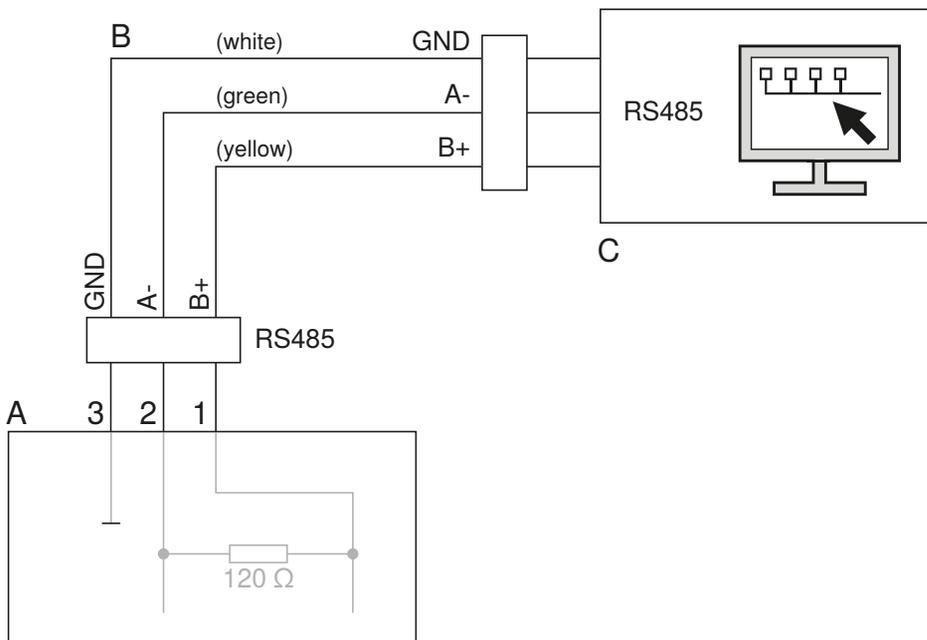


Figure 14: RS485 interface connection diagram, point to point

- A Control unit of the Geberit sanitary flush
- B Cable for RS485 interface, art. no. 616.205.00.1
- C Building service management system with RS485 connection

# Communication protocol

## Command and response

Commands and responses are made up of the following elements:

- start character (CMD, CON)
- command number
- access mode (SET, GET, RST, BSMS), command only
- parameter (VAL) with values, optional
- acknowledgement (ACK, NAK), response only
- ASCII control character SP (space) to separate the elements
- ASCII control character CR (carriage return) to complete a command line
- ASCII control character LF (line feed) to complete the command or response

Every command from the building service management system is followed immediately by a response from the Geberit sanitary flush. All characters are transferred in ASCII code.

The response consists of 2 parts: the acknowledgement of the command (ACK, NAK) and the actual response. In the event of an error, only the acknowledgement is returned (NAK).

The following example shows the command for querying the valve status and the accompanying response under normal circumstances and in the event of an error.

### Command

Element	Start character	Command number	Access mode
Command	C M D SP	5 0	SP G E T CR LF
ASCII	0x43 4D 44 20	35 30 20	47 45 54 0D 0A

### OK response

Element	Acknowledgement
Response (1)	A C K CR
ASCII	0x41 43 4B 0D

Element	Start character	Command number	Settings	Value 1	Value 2
Response (2)	C M D SP	5 0	SP V A L SP	0 SP	1 CR LF
ASCII	0x43 4D 44 20	35 30 20	56 41 4C 20	30 20	31 0D 0A

### Fault response

Element	Acknowledgement
Response (1)	N A K 2 CR LF
ASCII	0x4E 41 4B 32 0D 0A

Figure 15: Command for querying valve status

Table 5: Acknowledgement in response

Acknowledgement	Description
ACK	Command OK, no errors
NAK 2	Unknown start character
NAK 3	Unknown command number
NAK 4	Incorrect number of parameters
NAK 5	Incorrect value in parameters
NAK 6	Syntax error
NAK 7	No access rights → See "Send password", page 39.
NAK 99	Unknown error

## Timing

- The pause between sending individual characters must not exceed 100 ms.
- The pause between receiving a response and sending the next command must be at least 10 ms.

## Commands

Table 6: Overview of commands for the RS485 interface

Command	Command number	Description	→ See
Start communication	–	Starts communication and signals that the device is on standby	"Start communication", page 24
Activate valves	50	Opens or closes the solenoid valves for a flush actuation	"Activate valves", page 25
Query valve status	50	Displays the state of the solenoid valves (open or closed)	"Query valve status", page 27
Query sensor values	51	Displays the current values for the temperature and volumetric flow rate sensors	"Query sensor values", page 29
Query malfunction	81	Displays the cause of a malfunction	"Query malfunction", page 30
Reset malfunction	81	Resets a malfunction message	"Reset malfunction", page 33
Query warning	82	Displays the cause of a warning	"Query warning", page 35
Reset warning	82	Resets a warning message	"Reset warning", page 36
Query maintenance interval	90	Displays the time of the last maintenance and the maintenance interval	"Query maintenance interval", page 37
Reset maintenance interval	90	Resets the time of the last maintenance	"Reset maintenance time", page 38
Send password	92	Sends the password to change settings	"Send password", page 39

## Start communication

The “Start communication” command begins communication with the Geberit sanitary flush and signals that the building service management system is on standby. The sanitary flush is set to slave mode. The command consists of the CON start character and the access mode GLT.

### Command

C O N SP G L T CR LF

Table 7: “Start communication” command

Element	Description
CON	Start character
GLT	Access mode: Building service management system

### Response

A C K CR LF

Table 8: “Start communication” response

Element	Description
ACK	Acknowledgement → See Acknowledgement.

### Standby

The building service management system needs to periodically signal to the Geberit sanitary flush that it is on standby. To do this, the “Start communication” command – or any other command – must be sent at least every 5 minutes.

The first command sets the sanitary flush to slave mode. Slave mode is indicated by the green LED on the control unit of the sanitary flush. 2 short flash pulses are repeated every 2 seconds. If no command is sent for more than 5 minutes, slave mode is ended and the sanitary flush once again starts to execute the flushing programmes of the Geberit SetApp as defined in the <Flush settings> menu.

### Password protection

The password protection in the <Basic settings> menu in the Geberit SetApp is also used to change settings via the building service management system interface. If password protection has been activated, the “Send password” command must be executed following the “Start communication” command. → See “Send password”, page 39.

## Activate valves

The "Activate valves" command opens and closes the solenoid valves. The command offers 2 modes:

- In manual mode, the command must be sent twice: Once to open the valves and once to close the valves.
- In time-controlled mode, the valves are opened for the time "s".

### Command

C M D SP 5 0 SP S E T SP v SP m SP s... CR LF

Table 9: "Activate valves" command

Element	Description
CMD	Start character
50	Command number
SET	Access mode: Write
v	1 Valve V1 2 Valve V2 3 Both valves
m	0 Manual mode 1 Time-controlled mode
s...	m = 0: 0 Close valve 1 Open valve
	m = 1: s = Opening time of the valve in seconds

### Response

A C K CR

C M D SP 5 0 CR LF

Table 10: "Activate valves" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
50	Command number

### Example: Open valve 2

Command      C M D SP 5 0 SP S E T SP 2 SP 0 SP 1 CR LF  
 ASCII        0x43 4D 44 20 35 30 20 53 45 54 20 32 20 30 20 31 0D 0A

Response (1)    A C K CR  
 ASCII        0x41 43 4B 0D

Response (2)    C M D SP 5 0 CR LF  
 ASCII        0x43 4D 44 20 35 30 0D 0A

The following must be observed in addition for the Geberit sanitary flush in the concealed cistern:

---

## **ATTENTION**

### **Damage to the concealed cistern due to hot water**

Prolonged flushing with hot water can damage the concealed cistern. The building service management system must ensure that the following conditions are met:

- ▶ Maximum flush time per day and solenoid valve: 10 minutes
- ▶ Maximum flush volume per day and solenoid valve: 40 litres
- ▶ Minimum flush interval: 24 hours

## Query valve status

The "Query valve status" command displays the state of the solenoid valves (open or closed) and the reason for opening them.

### Command

C M D SP 5 0 SP G E T CR LF

Table 11: "Query valve status" command

Element	Description
CMD	Start character
50	Command number
GET	Access mode: read

### Response

A C K CR

C M D SP 5 0 SP V A L SP x SP y1... SP y2... SP z1... SP z2... CR LF

Table 12: "Query valve status" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
50	Command number
VAL	Values
x	0 No valves open 1 Valve V1 open 2 Valve V2 open 3 Both valves open
y1...	Reason for opening valve V1: 2 "Interval" flush mode 3 "Time" flush mode 4 "Volume" flush mode 5 "Temperature" flush mode 6 "Consumption" flush mode 100 <Test> button 101 Digital I/O interface 102 RS485 interface or <Test> menu in Geberit SetApp 103 RS485 interface or <Test> menu in Geberit SetApp
y2...	Reason for opening valve V2: 2 "Interval" flush mode 3 "Time" flush mode 4 "Volume" flush mode 5 "Temperature" flush mode 6 "Consumption" flush mode 100 <Test> button 101 Digital I/O interface 102 RS485 interface or <Test> menu in Geberit SetApp 103 RS485 interface or <Test> menu in Geberit SetApp

Element	Description
z1...	y1 = 2–6: z1 Number of the flushing programme for valve V1
z2...	y2 = 2–6: z2 Number of the flushing programme for valve V2

y1, y2, z1, z2: if no value can be displayed, e.g. if no valve is open, 0 is displayed.

## Query sensor values

The "Query sensor values" command displays the current values of the temperature sensors and volumetric flow rate sensors. By using these values, temperature-controlled or volume-dependent flushes can be implemented.

### Command

C M D SP 5 1 SP G E T CR LF

Table 13: "Query sensor values" command

Element	Description
CMD	Start character
51	Command number
GET	Access mode: read

### Response

A C K CR  
 C M D SP 5 1 SP V A L SP r... SP s... SP t... SP u... SP v... SP w... SP x... SP y... CR LF

Table 14: "Query sensor values" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
51	Command number
VAL	Values
r...	Temperature sensor S1, water temperature in 0.1 °C
s...	Temperature sensor S2, water temperature in 0.1 °C
t...	Volumetric flow rate sensor S1, water volume since opening the valve in 0.1 l <sup>1)</sup>
u...	Volumetric flow rate sensor S2, water volume since opening the valve in 0.1 l <sup>1)</sup>
v...	Volumetric flow rate sensor S1, current volumetric flow rate in 0.1 l/min
w...	Volumetric flow rate sensor S2, current volumetric flow rate in 0.1 l/min
x...	Reserved for future applications
y...	Reserved for future applications

<sup>1)</sup> The value is retained after the valve is closed. It is reset when the valve is next opened.

Sensor	Measurement value	Value in response
Temperature sensor S1	12.8 °C	r = 128
Volumetric flow rate sensor S1	102.9 l	t = 1029
Volumetric flow rate sensor S2	8.4 l/min	w = 84

## Query malfunction

The "Query malfunction" command queries the cause of a malfunction. A malfunction is indicated by the red LED and the buzzer on the control unit. Once the malfunction has been rectified, it must be reset using the "Reset malfunction" command. The malfunctions are displayed bitwise: 0 = No malfunction, 1 = Malfunction.

### Command

C M D SP 8 1 SP G E T CR LF

Table 15: "Query malfunction" command

Element	Description
CMD	Start character
81	Command number
GET	Access mode: read

### Response

A C K CR

C M D SP 8 1 SP V A L SP x... SP y... SP z... CR LF

Table 16: "Query malfunction" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
81	Command number
VAL	Values, coded bitwise → See example below
x...	General malfunction
	Bit 0 = Reserved for future applications
	Bit 1 = Backpressure The backpressure sensor is reporting backpressure. → Rectify backpressure. → Check backpressure sensor.
	Bit 2 = No activity on building service management system interface The building service management system interface (RS485, digital I/O) was inactive for too long (time-out). → Check building service management system interface. → Check connecting cable to building service management system. → Restart Geberit sanitary flush.
	Bit 3 = Error in the control unit → Reset the control unit to factory setting in the <Extras> menu in the Geberit SetApp. → Replace the control unit if the error persists.
	Bit 4 = General error → Restart control unit. → Replace control unit.

Element	Description
	V1 malfunction
	Bit 0 = Basic settings do not match The basic settings do not match the connected sensors and solenoid valves. → Compare sensors at S1 and the solenoid valve at V1 with basic settings.
	Bit 1 = No solenoid valve No solenoid valve is detected at V1. → Check existing solenoid valve at V1. → Check basic settings.
	Bit 2 = Short circuit at solenoid valve There is a short circuit at V1. → Replace solenoid valve V1.
	Bit 3 = No temperature sensor No temperature sensor is detected at S1. → Check existing temperature sensor at S1. → Check basic settings.
	Bit 4 = Short circuit at temperature sensor There is a short circuit at S1. → Replace temperature sensor or cable at S1.
	Bit 5 = No volumetric flow rate sensor No volumetric flow rate sensor is detected at S1. → Check existing volumetric flow rate sensor at S1. → Check basic settings.
y...	Bit 6 = Short circuit at volumetric flow rate sensor → There is a short circuit at S1. → Replace volumetric flow rate sensor or cable at S1.
	Bit 7 = Sensor error There is an error at S1. → Check sensors and cables at S1 and replace if necessary. → Check basic settings.
	Bit 8 = Through-flow even though solenoid valve is closed Volumetric flow rate sensor S1 is measuring a through-flow even though solenoid valve V1 is closed. → Check solenoid valve V1 and volumetric flow rate sensor S1. → Clean and test solenoid valve V1.
	Bit 9 = No through-flow even though solenoid valve is open Volumetric flow rate sensor S1 is not measuring any through-flow even though solenoid valve V1 is open. → Check solenoid valve V1 and volumetric flow rate sensor S1. → Clean screen filter in solenoid valve V1 and test solenoid valve.
	Bit 10 = Maximum flush time exceeded The specified water volume or temperature has not been reached. The maximum flush time in the flush modes <Volume> or <Temperature> has been exceeded. → Check solenoid valve V1 and volumetric flow rate sensor S1. → Clean screen filter in solenoid valve V1 and test solenoid valve.
	Bit 11 = Message from building service management system → Carry out action according to building service management system.
z...	V2 malfunction, same messages as for V1 malfunction

**Example: "Query malfunction" response**

A C K CR

C M D SP 8 1 SP V A L SP 1 7 SP 1 0 5 7 SP 2 5 6 CR LF

Value in response (decimal)	Value (binary)	Malfunctions
x = 17	1001	General malfunction: bit 1 and bit 4
y = 1057	10000100001	V1 malfunction: bit 0, bit 5 and bit 10
z = 256	100000000	V2 malfunction: bit 8

## Reset malfunction

The "Reset malfunction" command resets a malfunction message. The malfunctions are reset bitwise: 0 = No action, 1 = Reset malfunction. → See also the "Query malfunction", page 30 command.

### Command

C M D SP 8 1 SP R S T SP v SP w... CR LF

Table 17: "Reset malfunctions" command

Element	Description
CMD	Start character
81	Command number
RST	Access mode: reset
v	0 Reset general malfunction 1 Reset V1 malfunction 2 Reset V2 malfunction
w...	Reset malfunction, coded bitwise → See example in "Query malfunction", page 30.  If v = 0: Bit 1 = Reset "Backpressure" malfunction Bit 2 = Reset "No activity on building service management system interface" malfunction Bit 3 = Reset "Error in the control unit" malfunction Bit 4 = Reset "General error" malfunction  If v = 1 or 2: Bit 0 = Reset "Basic settings do not match" malfunction Bit 1 = Reset "No solenoid valve" malfunction Bit 2 = Reset "Short circuit at solenoid valve" malfunction Bit 3 = Reset "No temperature sensor" malfunction Bit 4 = Reset "Short circuit at temperature sensor" malfunction Bit 5 = Reset "No volumetric flow rate sensor" malfunction Bit 6 = Reset "Short circuit at volumetric flow rate sensor" malfunction Bit 7 = Reset "Sensor error" malfunction Bit 8 = Reset "Through-flow even though solenoid valve is closed" malfunction Bit 9 = Reset "Through-flow even though solenoid valve is open" malfunction Bit 10 = Reset "Maximum flush time exceeded" malfunction Bit 11 = Reset "Message from building service management system" malfunction

### Response

A C K CR

C M D SP 8 1 CR LF

Table 18: "Reset malfunctions" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
81	Command number

**Example: "Reset malfunctions" response**

C M D SP 8 1 SP R S T SP 2 SP 2 5 6 CR LF

Malfunctions	Value (binary)	Value in command (decimal)
Reset V2 malfunction	–	v = 2
Reset Bit 8 malfunction	10000000	w = 256

## Query warning

The "Query warning" command queries the cause of a warning. A warning is indicated by the flashing red LED on the control unit. If the problem which caused the warning is no longer present, the warning is automatically reset. A warning can also be reset with the "Reset warning" command.

### Command

The warnings are displayed bitwise: 0 = No warning, 1 = Warning.

C M D SP 8 2 SP G E T CR LF

Table 19: "Query warning" command

Element	Description
CMD	Start character
82	Command number
GET	Access mode: read

### Response

A C K CR  
C M D SP 8 2 SP V A L SP x... CR LF

Table 20: "Query warning" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
82	Command number
VAL	Values, coded bitwise → See example under "Query malfunction", page 30.
x...	Warning
	Bit 0 = Basic settings not set → Select the <Basic settings> menu in the Geberit SetApp.
	Bit 1 = Maintenance interval expired → Carry out annual maintenance, see maintenance manual 966.709.00.0.
	Bit 2 = Time and date no longer correct → Select the <Basic settings> menu in the Geberit SetApp and reset time and date.

## Reset warning

The "Reset warning" command resets a warning message. The warnings are reset bitwise: 0 = No action, 1 = Reset warning. → See also the "Query warning", page 35 command.

### Command

C M D SP 8 2 SP R S T SP v... CR LF

Table 21: "Reset warning" command

Element	Description
CMD	Start character
82	Command number
RST	Access mode: reset
v...	Reset warning, coded bitwise → See also examples under "Reset malfunction", page 33. Bit 0 = Reset "Basic settings not set" warning Bit 1 = Reset "Maintenance interval expired" warning Bit 2 = Reset "Time and date no longer correct" warning

### Response

A C K CR

C M D SP 8 2 CR LF

Table 22: "Reset warning" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
82	Command number

## Query maintenance interval

The "Query maintenance interval" command queries the time of the last maintenance and the maintenance interval.

If the maintenance interval has expired, the "Maintenance interval expired" warning will be displayed. → See the "Query warning", page 35 command.

### Command

```
C M D SP 9 0 SP G E T CR LF
```

Table 23: "Query maintenance interval" command

Element	Description
CMD	Start character
90	Command number
GET	Access mode: read

### Response

```
A C K CR  
C M D SP 9 0 SP V A L SP s... SP v v CR LF
```

Table 24: "Query maintenance interval" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
90	Command number
VAL	Values
s...	Time of last maintenance in seconds since 1.1.2000 00:00 Example: s = 468597600 = 5.11.2014 14:00
vv	vv = 01–99: maintenance interval in years

## Reset maintenance time

The "Reset maintenance time" command sets the time of the last maintenance to the current date. This command is executed after the maintenance work has been completed.

### Command

```
C M D SP 9 0 SP R S T SP v... CR LF
```

Table 25: "Reset maintenance time" command

Element	Description
CMD	Start character
90	Command number
RST	Access mode: reset

### Response

```
A C K CR
```

```
C M D SP 9 0 CR LF
```

Table 26: "Reset maintenance time" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
90	Command number

## Send password

The "Send password" command sends the password for changing settings to the Geberit sanitary flush. The password protection in the <Basic settings> menu in the Geberit SetApp is also used to change settings via the building service management system interface.

The following commands are protected when password protection has been activated:

- activate valves
- reset malfunction
- reset warning
- reset maintenance interval

Commands that query values are not protected by the password.

If password protection has been activated, the "Send password" command must be executed directly following the "Start communication" command.

### Command

```
C M D SP 9 2 SP G E T SP x... CR LF
```

Table 27: "Send password" command

Element	Description
CMD	Start character
92	Command number
GET	Access mode: read
x...	Password as defined in the Geberit SetApp

### Response

```
A C K CR
```

```
C M D SP 9 2 SP V A L SP y CR LF
```

Table 28: "Send password" response

Element	Description
ACK	Acknowledgement → See Acknowledgement.
CMD	Start character
92	Command number
VAL	Values
y	0 Incorrect password, no access rights 1 Password OK, access permitted

## Command sets

The examples below show command sets that are used to execute volume-dependent and temperature-dependent flushes.

The command sets are simplified. They do **not** contain the following:

- protocol frame for addressing the Geberit sanitary flushes in a bus system
- measures in the event of the solenoid valve malfunctioning
- measures in the event of the volume to be flushed or the required temperature (maximum flush time) not being reached
- periodic querying of warnings and malfunctions, and how the building service management system handles these

### Volume-dependent flush

The example below shows a command set for a volume-dependent flush. 50 litres are to be flushed every day at 7 a.m. For this purpose, solenoid valve V1 opens at 7 a.m. and the water volume that has flowed is periodically queried. Once 50 litres have been reached, the solenoid valve closes again.

The “Start communication” command is sent every 4 minutes to signal that the building service management system is on standby. Once the solenoid valve has opened and closed, the status of the solenoid valve is queried to ensure it is functioning correctly.

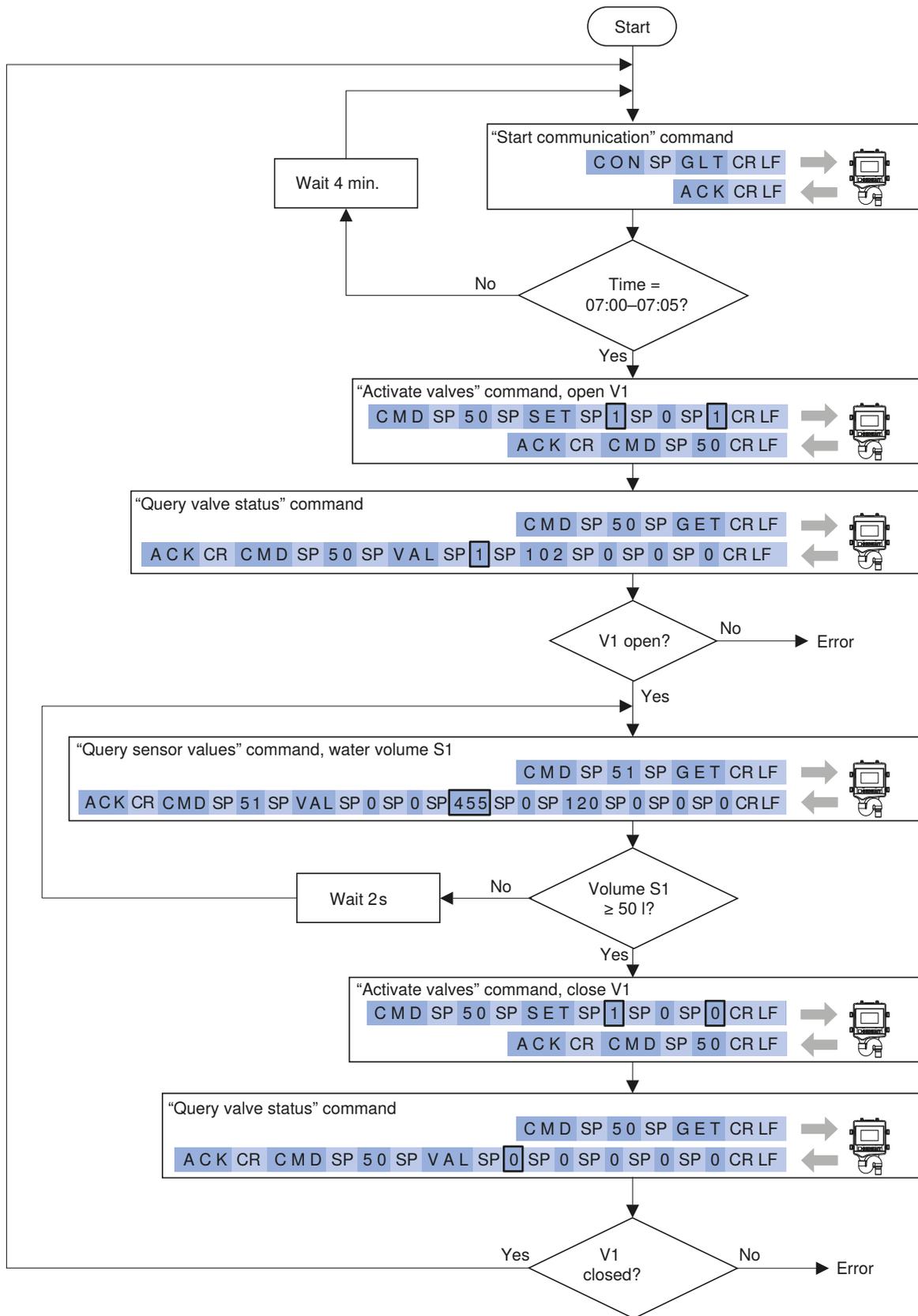


Figure 16: Command set for a volume-dependent flush

## Temperature-dependent flush

The example below shows a command set for a temperature-dependent flush. The water temperature in the cold-water pipe is queried periodically. If the water temperature exceeds 25 °C, solenoid valve V1 opens. If the water temperature drops below 18 °C, solenoid valve V1 closes again.

The water temperature is queried every 4 minutes to signal that the building service management system is on standby. Once the solenoid valve has opened and closed, the status of the solenoid valve is queried to ensure it is functioning correctly.

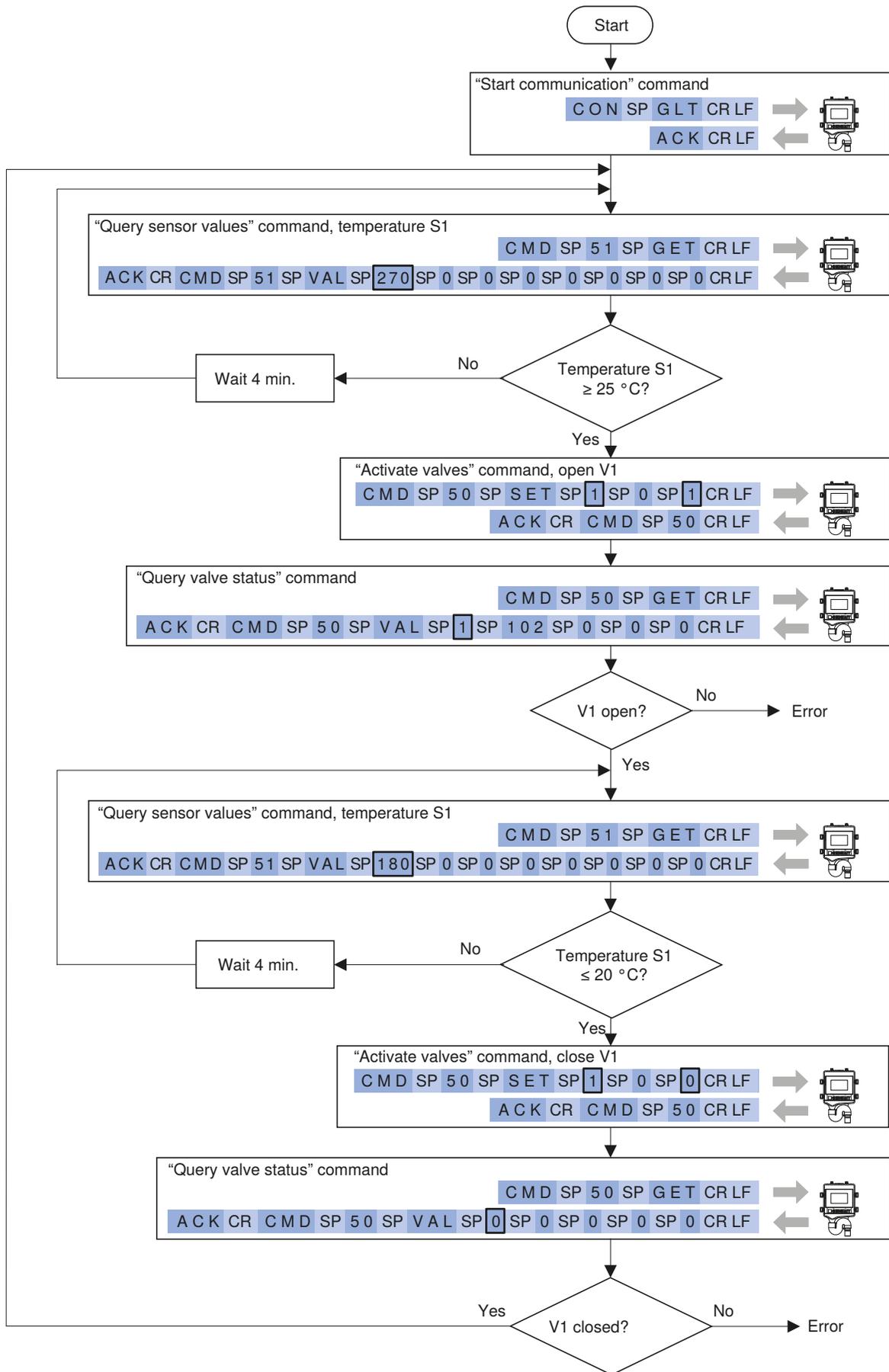


Figure 17: Command set for a temperature-dependent flush

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