GSM Controller BR160SM-Analog
BR161SM-Analog
V12
25.09.2014

Analog version for digital and analog signal monitoring

GSM module for SMS remote monitoring and control applications

Alarm Notification
Remote Control

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Features

- Internal 2-band (BR160SM) / 4-band (BR161SM) GSM-modem SIM900
- 6/4 digital input
- 4 analog input
- 3 Open-Drain MOSFET
- 1 Power Relay output
- Alarm notification using SMS messaging via cell phone
- Control via SMS
- Configuration from cell phone

Introduction

BR160SM-2A/-4A and BR161SM-2A/-4A GSM controller is a communications device that connects used for wireless Alarm Monitoring and Control of remote equipments and systems. Multiple users can interrogate the BieneRemote160SM or be notified on configurable events.


BR160SM-4A/2A, BR161SM-4A/2A - Analog version
BR160SM-2SMT,BR161SM-2SMT - Temperature version
BR160SM-GATE,BR161SM-GATE - Gate opener version for Gate control.
SMS Function

SMS controller send an event SMS messages to up to 4 cell phones. Any cell phone can be used to send SMS commands to BieneRemote160SM/161SM. Mobile users can contact and request information from a BieneRemote160SM/161SM GSM controller and up to 3 or 4 users can receive notification of events.

With the BR160SM/161SM GSM controller you can use a mobile phone to:

- Monitor the status of equipment or systems
- Send control commands to remote equipment
- Receive notification of events

Any BieneRemote160SM/161SM GSM controller can be used to send SMS commands to other BieneRemote GSM controller for remote control.

Any BieneRemote160SM/161SM GSM controller can be programmed via SMS instruction.

Input Signal Monitoring

The BieneRemote160SM/161SM has 6 voltage-free digital inputs that can be configured as:

- 0-1 or 1-0 event input
- each input can with jumper connect to pullup resistor to +12V
  But -2A version support only 4 digital inputs.

To receive SMS message by event on inputs, you need entering SMS message on a module (or SIM card) programming.

The BieneRemote160SM-4A has 4 analog inputs

- 0-10/0-5 Volt 10 bit resolution Analog Inputs
- 4-20mA 10 bit resolution Analog Inputs (optional)
Output Control

The BieneRemote160SM/161SM has 3 open-drain Outputs and 1 Power Relay Output. These may be controlled with SMS messages from approved users. To set any output as you like, you need only to send an SMS message.

Module to Module Control

The BieneRemote160SM/161SM supports Module-to-Module management with SMS command.

Users / Administrator

Phone numbers for administration users are contained in the SIM card phone book.
The BieneRemote160SM/161SM supports 3 administration users (contains in SIM phone book at position from 001), who can programmed/setting/controlled module with SMS command.

Alarm

Phone numbers for alarm SMS are contained in the EEPROM (SMS command for add/delete numbers see below).
SMS messages can be sent to users when an input reaches an alarm state. The following setpoint configurations are available:
Alarm when 0-1 or 1-0 event at digital input.
Alarm when above set point at analog input.
Alarm when below set point point at analog input.
Alarm when inside set points point at analog input.

Module Programming/Configuration

The BieneRemote160SM/161SM can be configured (programming) remotely with SMS command.
## Technical Specification

### BieneRemote160SM/161SM Hardware Specification

<table>
<thead>
<tr>
<th>BR160SM-S</th>
<th>BR160SM-4A/-2A</th>
<th>BR160SM-SMT</th>
<th>BR160SM-GATE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GSM band support</strong></td>
<td>GSM 900/1800, BR160SM</td>
<td>GSM 850/900/1800/1900, BR161SM</td>
<td></td>
</tr>
<tr>
<td><strong>Internal GSM modem</strong></td>
<td>Simcom SIM900</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RF Transmit Power</strong></td>
<td>Class 4 (2W) 900Mhz, Class 1 (1W) 1800Mhz, 1900Mhz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Command and data transmission</strong></td>
<td>SMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIM card reader</strong></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIM card type</strong></td>
<td>Phase 1 and phase 2+: SIM 3V / 1.8V</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Antenna Connection</strong></td>
<td>50Ω SMA (f) Connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Firmware</strong></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Digital inputs

- **Digital inputs type**
  - Voltage-free, transistor ("0": 0...+1V; "1": +1.5...+12V without external limited resistor); Optional: +12V/+5V pullup resistor for each input
- - **Number of digital inputs**
  - 6
  - 6
  - 4
  - 6
- - **Events digital inputs**
  - 6
  - 6
  - 4
  - 6
- - **Protection**
  - Yes

### Temperature sensor inputs

- **Temperature sensor**
  - SMT160-30 (Smartec)
- **Number of temperature inputs**
  - 2
- **Temperature input event**
  - min / norm / max
- **Temperature range**
  - -45 to +130°C
- **Events Temperature range**
  - -45 to +99 °C
- **Accuracy**
  - 1.2 - 1.7°C
- **Protection**
  - Yes

### Analog inputs

- **Number of analog inputs**
  - 4 / 2
- - **Maximum voltage**
  - 10VDC
  - 10VDC
  - 10VDC
  - 10VDC
- - **Analog input event**
  - min / norm / max
  - -
  - -
  - -
- - **ADC resolution**
  - 10-bit
  - -
  - -

### Outputs

- **Number of outputs**
  - 4
  - MOSFET Open Drain outputs: 3 (50V max)
  - Relay outputs: 1 (NO/COM/NC), 28VDC/230AC/ 5A
  - Digital output control: On-Off, Pulse (Standard and Gate version only)

### Gate Control

- **Call Control**
  - Yes
- **Number of user**
  - Up to 250

### Wiring

- **Wiring Connections**
  - Screw terminal blocks

### Power Supply

- **Required Power supply**
  - External +12 VDC stabilized, 1.7A minimum
- **Power requirement**
  - 60mA typ, 300mA(rms) max, 2A typ. (3A max) peak during transmission
- **Voltage regulator**
  - Internal voltage regulator
- **Power protection**
  - Reverse-polarity and overvoltage protection

### Environmental Conditions

- **Normal operating temperature range**
  - -20...+55°C
- **Restricted operating temperature range**
  - -25...+70°C (SIM900 can work, but the deviation from the GSM specification may occur)
- **Storage temperature range**
  - -40 to +80°C
- **Humidity**
  - 0-95% non-condensing

### Physical parameter

- **Board dimension**
  - 103 x 86.5 mm
- **Enclosure dimension**
  - 106 x 100 x 58 mm
- **Box**
  - DIN-rail mounting
- **Weight**
  - -
<table>
<thead>
<tr>
<th>Feature</th>
<th>BR160SM-S</th>
<th>BR160SM-4A/-2A</th>
<th>BR160SM-2SMT</th>
<th>BR160SM-GATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of controlled outputs</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of digital event inputs</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Number of readable digital inputs</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Number of analog event inputs</td>
<td>-</td>
<td>4 / 2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Number of readable analog data</td>
<td>-</td>
<td>4 / 2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Authorization cell phone numbers</td>
<td>3</td>
<td>4 / 3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Events cell phone numbers</td>
<td>3</td>
<td>4 / 3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>SMS events format</td>
<td></td>
<td>Text message</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMS digital data format</td>
<td>Binary</td>
<td>Binary</td>
<td>Binary</td>
<td>HEX</td>
</tr>
<tr>
<td>SMS message format for analog data</td>
<td></td>
<td>In % from Reference level 00 - 99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMS message format for temperature data</td>
<td></td>
<td>°C min level, max level -45°C - +99°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Application with

Temperature and humidity sensor Aw3005 and Aw3105

Output for Humidity: 0..5VDC
Accuracy of humidity:
  +2%RH(10-95%RH, 25Celsius); <+-5%RH(-40..80Celsius)
Hysteresis: +0.3%RH
Temperature sensor: DS18B20
Accuracy for temperature: +0.2Celsius(at 25Celsius)
Output for Temperature: 0..5VDC
Measuring temperature range: Customer can select measuring temperature range by dialing switches on PCB board:
  0~50Celsius, -20~80Celsius, -40~60Celsius
Electrical connection: Screw connector Max1.5mm²

AC and DC Current sensor with 0-10V / 0-5V or 4-20mA output

AC current sensors CTA, CTV and CS. Series current sensors monitor the current flowing to electrical equipment or buildings. Self-powered inducing the supply from the monitored conductor. All of these sensors have jumper selectable input ranges 0-10, 0-20, 0-50A or 0-100, 0-200, 0-250A.

DC Current sensor with 0-5V output

DC current sensor CYHCT-C2TV Chen Yang Technologies GmbH & Co KG
http://www.hallsensors.de/CYHCT-C2TV.pdf
-50A...+50A … -500A...+500A range.

Pressure sensor with 0-5V or 4-20mA output
Hardware

The BieneRemote160SM/161SM module consists of the microprocessor, voltage regulator, inputs driver, MOSFET output driver, relay, built-in GSM module, SIM-card holder, GSM antenna connector and screw terminals for external power supply and for input and output signal connection.
Power Supply

The BieneRemote160SM/161SM operates from a 12VDC power source. It draws less than 70mA standby, less than 350mA rms and 2A peak typ. (3A peak max.). 12VDC/1.7A...2.5A switching stabilized power supply is recommended. Power supply input has reverse polarity and overvoltage protection.

SIM Card

Small SIM-card with 3V / 1.8V technology

Preparation of SIM card

1. Delete any SMS messages from SIM.
2. **Disable PIN code** request so it will not prompt for a PIN code on turning on.
3. Write authorized numbers to Phone Book (from position 001) for disable authorization numbers. You can to position 1 write number 99 or delete number from position 001 in SIM phone book.
4. First SMS to module - **SETNR1** from your cell phone (store your number)

**Note:**
- The BieneRemote160SM/161SM can only be used with small SIM-cards with 3V/1.8V technology.
- For SIM card preparation you can use cell phone or external GSM modem.
- SIM card change if power turn off.

LED indicators

- Module status indication - RED LED (LED1)
- GSM Modem SIM900 status indication - GREEN LED (LED2)

**Module LED indication (Red LED)**

<table>
<thead>
<tr>
<th>LED status</th>
<th>Modem status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanently off</td>
<td>Device off</td>
</tr>
<tr>
<td>Short blinking after power on and</td>
<td>SIM card read process</td>
</tr>
<tr>
<td>after 1 min periodic blinking</td>
<td></td>
</tr>
<tr>
<td>Short blinking (period 5-6 sec)</td>
<td>Module in work</td>
</tr>
<tr>
<td>Permanently on</td>
<td>Module work with modem</td>
</tr>
</tbody>
</table>

**GSM Module SIM900 LED indication (Green LED)**

<table>
<thead>
<tr>
<th>LED status</th>
<th>Modem status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>SIM900 is not running</td>
</tr>
<tr>
<td>64ms On / 800ms Off</td>
<td>SIM900 does not find the network</td>
</tr>
<tr>
<td>64ms On / 3000ms Off</td>
<td>SIM900 find the network</td>
</tr>
<tr>
<td>64ms On / 300ms Off</td>
<td>GPRS communication</td>
</tr>
</tbody>
</table>
Connectors and Jumpers

- Power supply (X2 - screw terminal block).
- Controlled equipment inputs and outputs (X2, X3, X4 - screw terminal block)
- SMA female connector (X5) for GSM antenna connection.
- SIM holder (X1)

Power Supply Connection

+12VDC stabilized Power Supply must be connected with screw terminal block.
We recommend use stabilized 1.7...2.5A 12VDC power supply.
Power supply input has negative voltage and over voltage protection.

Internal +12VDC connection and Power Supply connection schematic.

Antenna connection

GSM antenna must be connected to SMA connector X5. Use only the 50Ohm antenna of the necessary frequency range. Base version completed with direct mount GSM antenna.

Note: It is very important that the antenna is installed on a location where the GSM-network coverage is sufficient. Please also check carefully that antennas are not installed nearby technical devices, cables etc which could influence the GSM-radiation.

Inputs and Outputs connection

Digital inputs and outputs must be connected with screw terminal blocks X2-X4.

Note: See also "Inputs and Outputs schematic".
Connectors

For Power supply, Inputs and Outputs connection used screw terminal blocks.

<table>
<thead>
<tr>
<th>OUT1</th>
<th>OUT2</th>
<th>OUT4</th>
<th>NC</th>
<th>COM</th>
<th>NO</th>
<th>+12V*</th>
</tr>
</thead>
<tbody>
<tr>
<td>GND</td>
<td>AN4</td>
<td>AN3</td>
<td>INP6</td>
<td>INP5</td>
<td>INP4</td>
<td>INP3</td>
</tr>
<tr>
<td>AN2</td>
<td>AN1</td>
<td>+5 V</td>
<td>INP1</td>
<td>GND</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+12V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+12V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+12V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+12V</td>
</tr>
</tbody>
</table>

+12V     -      +12VDC Power Supply input / +12VDC output
GND      -      GND
INP1...INP6 -      Digital Inputs 1-6
AN1...AN4  -      Analog Inputs 1-4
OUT1,OUT2,OUT4 -      Output 1, Output 2, Output 4
NO/COM/NC  -      Relay Output 3
+5V       -      +5V output (50mA max)

Additional Interface

Standard 2x3 pin ISP interface connector X1. Used only for in-system microcontroller programming.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MISO</td>
</tr>
<tr>
<td>2</td>
<td>VCC</td>
</tr>
<tr>
<td>3</td>
<td>SCK/</td>
</tr>
<tr>
<td>4</td>
<td>MOSI</td>
</tr>
<tr>
<td>5</td>
<td>Reset/</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
</tr>
</tbody>
</table>
Jumpers

Jumper J1

*Set events state 0-1 or 1-0*
- Set events state 0-1 (set jumper)

Enable all numbers for control - for new -4A version

Disable analog data in alarm SMS - for new -4A version

Jumper J0
Set jumper J0 for internal (BR160SM 12V) voltage monitoring.
Jumper J2

Connection pull-up resistor to digital inputs. 2,2kΩ resistor for each input is used. All resistor pulled up to +12V (+5V optional).

**Note**: Use this jumper only for Open Collector or Relay Output.

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**0-20mA mode**

You can set 0-20mA mode for each analog input: separately.

See Figure below (bottom PCB side)

For this mode need add 249Ω resistor on bottom PCB side.

- AN1 - Analog Input 1 - R52 (249Ω added for 0/4-20mA mode)
- AN2 - Analog Input 2 - R51 (249Ω added for 0/4-20mA mode)
- AN3 - Analog Input 3 - R50 (249Ω added for 0/4-20mA mode)
- AN4 - Analog Input 4 - R49 (249Ω added for 0/4-20mA mode)
Inputs / Outputs Schematic

Inputs

Digital Transistor Inputs

- Connector: Screw terminal block
- Inversion: Yes
- Driver: ULN2003
- Max input voltage: +12V without external limited resistor.
- Free Input: logic "0"
- Logic "0": 0V…+1V
- Logic "1": +1.5V…+12V
- J2 jumper – for pull-up resistor connections to +12VDC

0-10V / 0-5V Analog Inputs

- Connector: Screw terminal block
- Input type: CMOS
- Input Voltage: 0 to +10V
- Maximum input voltage: 10VDC
- Input impedance: 57 KOhm.
- ADC resolution: 10-bit
- 249 Ohm resistor – optional for 0-20/4-20mA applications
**Outputs**

**MOSFET Open Drain Outputs**

Connector: Screw terminal block  
MOSFET transistor: Si9945 or IRF7103  
Max. Voltage: 50V

**Relay Output**

Connector: Screw terminal block  
Outputs: NO/COM/NC  
Relay: SPDT power relay  
Breaking capacity: 5 A 230VAC / 28VDC  
Min load: 0.1 A, 5VDC
Connection Example

Connection example to Input Driver (Input 1-5 on terminal block)

1-0 and 0-1 event notification

You can use J2 pin header for in-board pull-up resistor connection.

Relay connection example to Output Driver (Output 1 and 2 on terminal block)

Electromechanical relay connection.

Solid-state-relay (SSR) connection.
Module programming

For module programming:

- SIM card preparation
- Programming with send control SMS (see paragraph 'SMS Control Command List')

SIM card preparation

- Delete any SMS messages from SIM.
- **Disable PIN code** request so it will not prompt for a PIN code on turning on
- Write authorized numbers to Phone Book (from position 001) for disable authorization numbers. You can to position 1 write number 99 or delete number from position 001 in SIM phone book.
- First SMS to module - `SETNR1` from your cell phone (store your number)

Note:
- The BieneRemote160GM/161SM can only be used with small SIM-cards with 3V/1.8V technology.
- For SIM card preparation you can use cell phone or external GSM modem.

Set phone numbers from which management is authorized

<table>
<thead>
<tr>
<th>Location</th>
<th>Phone Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1</td>
</tr>
<tr>
<td>2</td>
<td>A2</td>
</tr>
<tr>
<td>3</td>
<td>A3</td>
</tr>
</tbody>
</table>

Note 1: full phone number with country code

Example - enable 3 phone numbers for BieneRemote management

<table>
<thead>
<tr>
<th>Location</th>
<th>Phone Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1</td>
</tr>
<tr>
<td>2</td>
<td>A2</td>
</tr>
<tr>
<td>3</td>
<td>A3</td>
</tr>
</tbody>
</table>

Example - enable all phone numbers (disable authorization numbers)

<table>
<thead>
<tr>
<th>Location</th>
<th>Phone Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1</td>
</tr>
<tr>
<td>2</td>
<td>A2</td>
</tr>
<tr>
<td>3</td>
<td>A3</td>
</tr>
</tbody>
</table>
Programming with SMS control command

Set alarm SMS text message

Send SMS command SETTX (see paragraph ‘SMS Control Command List’):

SETTXN [text]

where:

for version BR160SM-2A/BR161SM-2A

N = 0,1,2,3 for digital inputs 1,2,3,4
N = 4,5,6 for analog input 1 (>max; <min; normal)
N = 7,8,9 for analog input 2 (>max; <min; normal)

[text] - individual text message (text length max 18 characters)

N = 0 - alarm text message for digital inputs 1
N = 1 - alarm text message for digital inputs 2
N = 2 - alarm text message for digital inputs 3
N = 3 - alarm text message for digital inputs 4
N = 4 - alarm text message for > maximum level on analog inputs 1
N = 5 - alarm text message for < minimum level on analog inputs 1
N = 6 - alarm text message for normal level on analog inputs 1
N = 7 - alarm text message for > maximum level on analog inputs 2
N = 8 - alarm text message for < minimum level on analog inputs 2
N = 9 - alarm text message for normal level on analog inputs 2

Example:

SETTX0,ALARM DETECTION - set text SMS message ‘ALARM DETECTION’ for digital input 1
SETTX1,EVENT INPUT 2 - set text SMS message ‘EVENT INPUT 2’ for digital input 2
SETTX2,EVENT INPUT 3 - set text SMS message ‘EVENT INPUT 3’ for digital input 3
SETTX3,EVENT INPUT 4 - set text SMS message ‘EVENT INPUT 4’ for digital input 4
SETTX4,WATER HIGH - set text SMS message ‘WATER OVERFLOW’ for analog input 1
SETTX5,WATER LOW - set text SMS message ‘WATER BELOW MINIMUM’ for analog input 1
SETTX6,WATER NORMAL - set text SMS message ‘WATER LEVEL NORMAL’ for analog input 1
SETTX7,VOLTAGE HIGH - set text SMS message ‘A2 OVERFLOW’ for analog input 2
SETTX8,VOLTAGE LOW - set text SMS message ‘A2 BELOW MINIMUM’ for analog input 2
SETTX9,VOLTAGE NORMAL - set text SMS message ‘A2 NORMAL’ for analog input 2
for version BR160SM-4A/BR161SM-4A

N = 01,02,03,04,05,06 for digital inputs 1,2,3,4,5,6
N = 07,08,09 for analog input 1 (>max; <min; normal)
N = 10,11,12 for analog input 2 (>max; <min; normal)
N = 13,14,15 for analog input 3 (>max; <min; normal)
N = 16,17,18 for analog input 4 (>max; <min; normal)

[text] - individual text message (text length max 18 characters)

N = 01 - alarm text message for digital inputs 1
N = 02 - alarm text message for digital inputs 2
N = 03 - alarm text message for digital inputs 3
N = 04 - alarm text message for digital inputs 4
N = 05 - alarm text message for digital inputs 5
N = 06 - alarm text message for digital inputs 6
N = 07 - alarm text message for > maximum level on analog inputs 1
N = 08 - alarm text message for < minimum level on analog inputs 1
N = 09 - alarm text message for normal level on analog inputs 1
N = 10 - alarm text message for > maximum level on analog inputs 2
N = 11 - alarm text message for < minimum level on analog inputs 2
N = 12 - alarm text message for normal level on analog inputs 2
N = 13 - alarm text message for > maximum level on analog inputs 3
N = 14 - alarm text message for < minimum level on analog inputs 3
N = 15 - alarm text message for normal level on analog inputs 3
N = 16 - alarm text message for > maximum level on analog inputs 4
N = 17 - alarm text message for < minimum level on analog inputs 4
N = 18 - alarm text message for normal level on analog inputs 4

Example:

SETTX01,ALARM DETECT
SETTX02,EVENT INP 2
SETTX07,WATER HIGH
SETTX08,WATER LOW
SETTX09,WATER NORM
SETTX10,VOLTAGE HIGH
SETTX11,VOLTAGE LOW
SETTX12,VOLTAGE NORM

Acknowledge SMS:
N [text]

Set cell phone number for alarm SMS

For number Nr.1 setting send SMS command SETNR1 from cell phone with Nr.1
for number Nr.2 setting send SMS command SETNR2 from cell phone with Nr.2
for number Nr.3 setting send SMS command SETNR3 from cell phone with Nr.3
for number Nr.4 setting send SMS command SETNR4 from cell phone with Nr.4 *)

for clear number Nr.1 send SMS command CLRNR1 from any cell phone
for clear number Nr.2 send SMS command CLRNR2 from any cell phone
for clear number Nr.3 send SMS command CLRNR3 from any cell phone
for clear number Nr.4 send SMS command CLRNR4 from any cell phone *)

*) - only for version BR160SM-4A
Set reference level (for all analog inputs)

REFLV2 - set reference level +2.56V
REFLV5 - set reference level +5V (default)

Set minimum and maximum level (for analog inputs)

MINLVN,AA
MAXLVN,AA

where:
N = 1,2,3,4 (analog input number)
   1 or 2 for version BR160SM-2A and 1,2,3 or 4 for version BR160SM-4A
AA = 00…99 (% from Reference level)

Default minimum and maximum level = 00; Maximum level > 5%
If Max level = 00, then alarm for this level disabled
If Min level = 00, then alarm for this level disabled

Example:
MINLV1,30 - set minimum level 30% for analog input 1
MAXLV1,80 - set maximum level 80% for analog input 1
MINLV1,00 - set minimum level 00% for analog input 1
MAXLV2,85 - set maximum level 85% for analog input 2

Set cell phone number for management
(number will be in SIM phone book - see “SIM card preparation”)

Send SMS command SETNR1 from cell phone with number Nr.1
Send SMS command SETNR2 from cell phone with number Nr.2
Send SMS command SETNR3 from cell phone with number Nr.3
Send SMS command SETNR4 from cell phone with number Nr.4 (only for version -4A)

For clear number
Clear number 1 - SMS command CLRNR1 from any cell phone
Clear number 2 - SMS command CLRNR2 from any cell phone with
Clear number 3 - SMS command CLRNR3 from any cell phone with
Clear number 4 - SMS command CLRNR4 from any cell phone with (only for version -4A)

Set digital signal filter and alarm SMS mask (for BieneRemote160SM-2A)

MASK F,1234A

where:
F = 0..9 - digital signal filter in sec (default = F = 1 sec); if F=0, then filter=25-50ms
1,2,3,4 - phone number mask for digital inputs 1,2,3,4
A - phone number mask for analog inputs 1,2

Example:  MASK 0,30124
see table:

<table>
<thead>
<tr>
<th>F</th>
<th>Digital input 1</th>
<th>Digital input 2</th>
<th>Digital input 3</th>
<th>Digital input 4</th>
<th>Analog input 1,2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nr.3</td>
<td>Nr.2</td>
<td>Nr.1</td>
<td>Nr.3</td>
<td>Nr.2</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Nr.1, Nr.2, Nr.3 - cell phone number for alarm SMS sending (see command SETNR1, SETNR2, SETNR3 in paragraph SMS Control Command List)

If event on digital input 1, then module send alarm SMS to Nr1 and Nr2 cell phone.
If event on digital input 2, then module not send alarm SMS.
If event on digital input 3, then module send alarm SMS to Nr1 cell phone.
If event on digital input 4, then module send alarm SMS to Nr2 cell phone.
If event on analog input 1 or 2, then module send alarm SMS to Nr3 cell phone.

Set digital signal filter (for BieneRemote160SM-4A)

FLTR F

F = 0..9 - digital signal filter in sec (default: F = 1sec); if F=0, then filter=25-50ms.

Read status SMS command:

GETST

Answer SMS message format:

INP=000000 OUT=1111 +5V E

where:

INP= - inputs 654321 state
OUT= - outputs 4321 state
+5V - reference level (+5V or 2.56V)
E - E: alarm enable; D: alarm disable
### Event Input

<table>
<thead>
<tr>
<th>Digital 1</th>
<th>Digital 2</th>
<th>Digital 3</th>
<th>Digital 4</th>
<th>Digital 5</th>
<th>Digital 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settx0,text1</td>
<td>Settx1,text2</td>
<td>Settx2,text3</td>
<td>Settx3,text4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settx01,text1</td>
<td>Settx02,text2</td>
<td>Settx03,text3</td>
<td>Settx04,text4</td>
<td>Settx05,text5</td>
<td>Settx06,text6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analog 1</th>
<th>Analog 2</th>
<th>Analog 3</th>
<th>Analog 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settx4,textA1max</td>
<td>Settx7,textA2max</td>
<td>Settx13,textA3max</td>
<td>Settx16,textA4max</td>
</tr>
<tr>
<td>Settx07,textA1max</td>
<td>Settx10,textA2max</td>
<td>Settx15,textA3normal</td>
<td>Settx18,textA4normal</td>
</tr>
<tr>
<td></td>
<td>Settx11,textA2min</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Settx12,textA2normal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Digital 1 Settx0, Digital 2 Settx1, Digital 3 Settx2, Digital 4 Settx3, Digital 5 Settx05, Digital 6 Settx06

### Analog 1 > MAX

### Analog 1 < MIN

### Analog 2 > MAX

### Analog 2 < MIN

### Analog 2 normal

### Analog 3 > MAX

### Analog 3 < MIN

### Analog 3 normal

### Analog 4 > MAX

### Analog 4 < MIN

### Analog 4 normal

### Output control

<table>
<thead>
<tr>
<th>Output control</th>
<th>Set (ON)</th>
<th>Reset (OFF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setou1</td>
<td>Rstou1</td>
</tr>
<tr>
<td>2</td>
<td>Setou2</td>
<td>Rstou2</td>
</tr>
<tr>
<td>3</td>
<td>Setou3</td>
<td>Rstou3</td>
</tr>
<tr>
<td>4</td>
<td>Setou4</td>
<td>Rstou4</td>
</tr>
</tbody>
</table>

### Number in EEPROM

<table>
<thead>
<tr>
<th>Number in EEPROM</th>
<th>Set number for alarm SMS</th>
<th>Send SMS from cell phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setnr1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Setnr2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Setnr3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Setnr4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number in EEPROM</th>
<th>Clear number from alarm SMS</th>
<th>Send SMS from cell phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clmr1</td>
<td>any</td>
</tr>
<tr>
<td>2</td>
<td>Clmr2</td>
<td>any</td>
</tr>
<tr>
<td>3</td>
<td>Clmr3</td>
<td>any</td>
</tr>
<tr>
<td>4</td>
<td>Clmr4</td>
<td>any</td>
</tr>
</tbody>
</table>
How to send alarm SMS message on some cell phones or SMS command on other BieneRemote module.

If you will receive alarm SMS on some cell phone:
Send SMS command **SETNR1** from cell phone with number Nr.1
Send SMS command **SETNR2** from cell phone with number Nr.2
Send SMS command **SETNR3** from cell phone with number Nr.3
Send SMS command **SETNR4** from cell phone with number Nr.4 (only for version -4A)

For clear number
for clear number 1 - SMS command **CLRNR1** from any cell phone
for clear number 2 - SMS command **CLRNR2** from any cell phone
for clear number 3 - SMS command **CLRNR3** from any cell phone
for clear number 4 - SMS command **CLRNR3** from any cell phone  (only for version -4A)

If event on digital input, you receive alarm SMS on cell phone with phone number Nr.1 and/or cell phone with phone number Nr.2 and/or cell phone with phone number Nr.3 (see SMS command **MASK** in paragraph SMS Control Command List only for version -2A)

You can instead of cell phone have another BieneRemote module. In this case instead of alarm SMS text message you can write SMS command.
Example, if water level overflow first BieneRemote module send SMS command (SETOU, RSTOU) to second BieneRemote module and turn off pump.
Remote control

We can 'turn on' and 'turn off' outputs with SMS command:

**SETOU**

and

**RSTOU**

**SETOU1, SETOU2, SETOU3, SETOU4** - set output 1, 2, 3, 4 - active state.

**RSTOU1, RSTOU2, RSTOU3, SETOU4** - reset output 1, 2, 3, 4 - passive state (default).

Answer SMS:

**INP=000000 OUT=1111 +5V E**

Digital signal monitoring

**Read digital input/output status SMS command:**

**GETST**

Answer SMS message format:

**INP=000000 OUT=1111 +5V E**

where:

**INP=** - inputs 6,5,4,3,2,1 state  
**OUT=** - outputs 4,3,2,1 state  
**+5V** - reference level (+5V or 2.56V)  
**E** - E: alarm enable; D: alarm disable

Alarm SMS

You receive alarm SMS message, if 1-0 (or 0-1) on digital input 1,2,3,4 for version BR160SM-2A or on digital input 1,2,3,4,5,6 for version BR160SM-4A

Alarm SMS for digital input 1: [text 0]  
Alarm SMS for digital input 2: [text 1]
Alarm SMS for digital input 3: [text 2]
Alarm SMS for digital input 4: [text 3]
where:
[text 0], [text 1], [text 2], [text 3] (individual text message) you can set with SMS command:

SETXT0 [text], SETXT1 [text], SETXT2 [text], SETXT3 [text]

Text length max 18 characters for version -2A and max. 12 characters for version -4A.

Filter for digital inputs can set with command:

MASK N,11113 (version BR160SM-2A)
or
FLTR N (version BR160SM-4A)
Analog signal monitoring

Read analog data SMS command:

GETAN

Answer SMS message format for version BR160SM-2A:
A1=37 A2=53 A1:00 85 A2:00 00

<table>
<thead>
<tr>
<th>Analog signal 1</th>
<th>Analog signal 2</th>
<th>Analog signal 1 level</th>
<th>Analog signal 2 level</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1= 37</td>
<td>A2= 53</td>
<td>A1: 00</td>
<td>A2: 00</td>
</tr>
<tr>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Min</td>
<td>max</td>
<td>min</td>
<td>max</td>
</tr>
</tbody>
</table>

% from Reference level.

Answer SMS message format for version BR160SM-4A:
A1=37 A2=53 A3=00 A4=00 A1:00 85 A2:00 00 A3:00 00 A4:00 00

Set reference level (for all analog inputs)

REFLV2 - set reference level +2.56V (use for 0-20mA / 4-20mA mode)
REFLV5 - set reference level +5V (default, for 0-10V mode)

Acknowledge SMS:
A1=35 A2=47 A1: 20 80 A2: 00 00 (version BR160SM-2A)
Acknowledge SMS:
A1=35 A2=47 A3=00 A4=00 A1: 20 80 A2: 00 00 A3: 00 00 A4: 00 00 (version BR160SM-2A)

Set minimum and maximum level

You can (individual for each analog input) set minimum and maximum level.

If signal on analog input > maximum level, module send alarm SMS:
A1 > max A1=90 A2=53
If signal return from > maximum level to normal level, module send alarm SMS:
A1 normal A1=68 A2=53
If signal on analog input < minimum level, module send alarm SMS:
A1 < max A1=13 A2=53
If signal return from < minimum level to normal level, module send alarm SMS:
A1 normal A1=45 A2=53

Level = 00 – alarm disable.

MINLNVN AA
MAXLNVN AA

where:
N - analog input number
  1, 2 for version BR160SM-2A; 1, 2, 3 or 4 for version BR160SM-4A
AA - = 00...99 (% from reference level)
Default minimum and maximum level = 00; Maximum level > 5%
If Max level = 00, then alarm for this level disable
If Min level = 00, then alarm for this level disable

**MINLV1 30** - set minimum level 30% for analog input 1
**MAXLV1 80** - set maximum level 80% for analog input 1
**MINLV1 00** - set minimum level 00% for analog input 2
**MAXLV2 85** - set maximum level 85% for analog input 2

Acknowledgment SMS (version BR160SM-2A):
A1=35 A2=47 A1: 20 80 A2: 00 00
Acknowledgment SMS (version BR160SM-2A):
A1=35 A2=47 A3=00 A4=00 A1: 20 80 A2: 00 00 A3: 00 00 A4: 00 00

**Analog signal Filter**

Analog inputs have programm filter.
Alarm SMS

For version version BR160SM-2A

Alarm SMS message for analog input 1:
[text 4] A1=92 A2=69
[text 5] A1=12 A2=53
[text 6] A1=41 A2=69
where: [text 4], [text 5], [text 6] - individual text message.

Text message you can set with SMS command:
SETTX4 [text], SETTX5 [text], SETTX6 [text]

[text 4] - analog signal > maximum level
[text 5] - analog signal < minimum level
[text 6] - analog signal - normal level

Alarm SMS message for analog input 2:
[text 7] A1=32 A2=91
[text 8] A1=41 A2=13
[text 9] A1=41 A2=69

For version version BR160SM-4A/BR161SM-4A

Alarm SMS message for analog input 1:
[text 07] A1=92 A2=69 A3=00 A4=00
[text 08] A1=92 A2=69 A3=00 A4=00
[text 09] A1=92 A2=69 A3=00 A4=00
where: [text 07], [text 08], [text 09] - individual text message.

Text message you can set with SMS command:
SETTX07 [text], SETTX08 [text], SETTX09 [text]

[text 07] - analog signal > maximum level
[text 08] - analog signal < minimum level
[text 09] - analog signal - normal level

Alarm SMS message for analog input 2:
[text 10] A1=92 A2=69 A3=00 A4=00
[text 11] A1=92 A2=69 A3=00 A4=00
[text 12] A1=92 A2=69 A3=00 A4=00
Alarm SMS message for analog input 3:
[text 13] A1=92 A2=69 A3=00 A4=00
[text 14] A1=92 A2=69 A3=00 A4=00
[text 15] A1=92 A2=69 A3=00 A4=00
Alarm SMS message for analog input 4:
[text 16] A1=92 A2=69 A3=00 A4=00
[text 17] A1=92 A2=69 A3=00 A4=00
[text 18] A1=92 A2=69 A3=00 A4=00

Text length max 18 characters.
### Control Command List for BR160SM-2A, Br161SM-2A

<table>
<thead>
<tr>
<th>Command</th>
<th>Function</th>
<th>Return Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getst</td>
<td>Get Status</td>
<td>INP=000000 OUT=1111 Ref.+5V</td>
<td>Get input state, output state, reference level (for ADC), alarm status</td>
</tr>
<tr>
<td>Getan</td>
<td>Read Analog Data</td>
<td>A1=57 A2=49 A1: 20 70 A2: 40 00</td>
<td>Get analog data (in %), Level min max</td>
</tr>
<tr>
<td>Setou1</td>
<td>Set Output 1</td>
<td>Status data</td>
<td>Set Output 1 to ‘1’ (to ‘0’ on terminal block)</td>
</tr>
<tr>
<td>Setou2</td>
<td>Set Output 2</td>
<td>Status data</td>
<td>Set Output 2 to ‘1’ (to ‘0’ on terminal block)</td>
</tr>
<tr>
<td>Setou3</td>
<td>Set Output 3</td>
<td>Status data</td>
<td>Set Output 3 to ‘1’ (to ‘0’ on terminal block)</td>
</tr>
<tr>
<td>Rstou1</td>
<td>Reset Output 1</td>
<td>Status data</td>
<td>Set Output 1 to ‘0’ (to ‘1’ on terminal block)</td>
</tr>
<tr>
<td>Rstou2</td>
<td>Reset Output 2</td>
<td>Status data</td>
<td>Set Output 2 to ‘0’ (to ‘1’ on terminal block)</td>
</tr>
<tr>
<td>Rstou3</td>
<td>Reset Output 3</td>
<td>Status data</td>
<td>Set Output 3 to ‘0’ (to ‘1’ on terminal block)</td>
</tr>
<tr>
<td>Reflv2</td>
<td>Reference Source Change</td>
<td>Status data</td>
<td>ADC Reference Source +2,56V</td>
</tr>
<tr>
<td>Reflv5</td>
<td>Reference Source Change</td>
<td>Status data</td>
<td>ADC Reference Source +5V</td>
</tr>
<tr>
<td>Minlv1,M</td>
<td>Set min level for analog input 1</td>
<td>A1=57 A2=49 A1: 20 70 A2: 40 00</td>
<td>Set minimum level for analog input 1</td>
</tr>
<tr>
<td>Minlv2,M</td>
<td>Set min level for analog input 2</td>
<td>A1=57 A2=49 A1: 20 70 A2: 40 00</td>
<td>Set minimum level for analog input 2</td>
</tr>
<tr>
<td>Maxlv1,M</td>
<td>Set max level for analog input 1</td>
<td>A1=57 A2=49 A1: 20 70 A2: 40 00</td>
<td>Set maximum level for analog input 1</td>
</tr>
<tr>
<td>Maxlv2,M</td>
<td>Set max level for analog input 2</td>
<td>A1=57 A2=49 A1: 20 70 A2: 40 00</td>
<td>Set maximum level for analog input 2</td>
</tr>
<tr>
<td>Seten</td>
<td>Event notification enable</td>
<td>Status data</td>
<td>Set active mode - Event notification enable</td>
</tr>
<tr>
<td>Setdi</td>
<td>Event notification disable</td>
<td>Status data</td>
<td>Set passive mode - Event notification disable</td>
</tr>
<tr>
<td>SetnrN</td>
<td>Set number</td>
<td>Status data</td>
<td>Set cell phone for alarm notification</td>
</tr>
<tr>
<td>ClmrN</td>
<td>Clear number</td>
<td>Status data</td>
<td>Clear cell phone for alarm notification</td>
</tr>
<tr>
<td>SetxZ,TEXT</td>
<td>Set text SMS</td>
<td>Z TEXT</td>
<td>Set text SMS: 0,1,2,3 - event digital input 1,2,3,4 4,5,6 - event anal.inp.1 (max, min, normal) 7,8,9 - event anal.inp.2 (max, min, normal)</td>
</tr>
<tr>
<td>Mask F,ABCDE</td>
<td>Set digital signal filter (in sec)</td>
<td>Status data</td>
<td>Set mask for cell phone number Nr.1, Nr.2, Nr.3 for alarm SMS sending. See note 3</td>
</tr>
</tbody>
</table>

**Note 1:** Not case sensitive. You can use GETST, Getst.

**Note 2:** If Max level = 00, then alarm for this level disable.
If Min level = 00, then alarm for this level disable.

**Note 3:** Digital signal filter =N sec. If signal duration > N, then you receive alarm SMS.

### Setting for outgoing Phone Numbers for alarm SMS:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (B,C,D)</td>
<td>for digital inputs 1 (2,3,4):</td>
</tr>
<tr>
<td>0 - no send SMS</td>
<td></td>
</tr>
<tr>
<td>1 - send SMS0 (1:2;3) to Nr1</td>
<td></td>
</tr>
<tr>
<td>2 - send SMS0 (1:2;3) to Nr2</td>
<td></td>
</tr>
<tr>
<td>3 - send SMS0 (1:2;3) to Nr1,Nr2</td>
<td></td>
</tr>
<tr>
<td>4 - send SMS0 (1:2;3) to Nr3</td>
<td></td>
</tr>
<tr>
<td>5 - send SMS0 (1:2;3) to Nr1,Nr3</td>
<td></td>
</tr>
<tr>
<td>6 - send SMS0 (1:2;3) to Nr2,Nr3</td>
<td></td>
</tr>
<tr>
<td>7 - send SMS0 (1:2;3) to Nr1,Nr2,Nr3</td>
<td></td>
</tr>
</tbody>
</table>

E for all analog inputs:
0 - no send SMS
1 - send SMS4 (5;6;7;8;9) to Nr1
2 - send SMS4 (5;6;7;8;9) to Nr2
3 - send SMS4 (5;6;7;8;9) to Nr1,Nr2
4 - send SMS4 (5;6;7;8;9) to Nr3
5 - send SMS4 (5;6;7;8;9) to Nr1,Nr3
6 - send SMS4 (5;6;7;8;9) to Nr2,Nr3
7 - send SMS4 (5;6;7;8;9) to Nr1,Nr2,Nr3

## Control Command List for BR160SM-4A/BR161SM-4A

<table>
<thead>
<tr>
<th>Command</th>
<th>Function</th>
<th>Return Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getst</td>
<td>Get Status</td>
<td>INP=000000 OUT=111 +5V E</td>
<td>Get input state, output state, reference level (for ADC), alarm status (enable/disable)</td>
</tr>
<tr>
<td>Getan</td>
<td>Read Analog Data</td>
<td>A1=57 A2=49 A3=00 A4=00 A1: 20 70 A2: 40 00 A3: 00 00 A4: 00 00</td>
<td>Get analog data (in %). Level min max</td>
</tr>
<tr>
<td>Setou1</td>
<td>Set Output 1</td>
<td>Status data</td>
<td>Set Output 1 to ‘1’ (to ‘0’ on terminal block)</td>
</tr>
<tr>
<td>Setou2</td>
<td>Set Output 2</td>
<td>Status data</td>
<td>Set Output 2 to ‘1’ (to ‘0’ on terminal block)</td>
</tr>
<tr>
<td>Setou3</td>
<td>Set Output 3</td>
<td>Status data</td>
<td>Set Output 3 to ‘1’ (to ‘0’ on terminal block)</td>
</tr>
<tr>
<td>Rstou1</td>
<td>Reset Output 1</td>
<td>Status data</td>
<td>Set Output 1 to ‘0’ (to ‘1’ on terminal block)</td>
</tr>
<tr>
<td>Rstou2</td>
<td>Reset Output 2</td>
<td>Status data</td>
<td>Set Output 2 to ‘0’ (to ‘1’ on terminal block)</td>
</tr>
<tr>
<td>Rstou3</td>
<td>Reset Output 3</td>
<td>Status data</td>
<td>Set Output 3 to ‘0’ (to ‘1’ on terminal block)</td>
</tr>
<tr>
<td>Reflv2</td>
<td>Reference Source Change</td>
<td>Status data</td>
<td>ADC Reference Source +2,56V</td>
</tr>
<tr>
<td>Reflv5</td>
<td>Reference Source Change</td>
<td>Status data</td>
<td>ADC Reference Source +5V</td>
</tr>
<tr>
<td>MinlvN,M</td>
<td>Set min level for analog input N</td>
<td>A1=57 A2=49 A3=00 A4=00 A1: 20 70 A2: 40 00 A3: 00 00 A4: 00 00</td>
<td>Set minimum level for analog input N N=1,2,3 or 4 M = 00..99</td>
</tr>
<tr>
<td>MaxlvN,M</td>
<td>Set max level for analog input N</td>
<td>A1=57 A2=49 A3=00 A4=00 A1: 20 70 A2: 40 00 A3: 00 00 A4: 00 00</td>
<td>Set maximum level for analog input N N=1,2,3 or 4 M = 00..99</td>
</tr>
<tr>
<td>Seten</td>
<td>Event notification enable</td>
<td>Status data</td>
<td>Set active mode - Event notification enable</td>
</tr>
<tr>
<td>Setdi</td>
<td>Event notification disable</td>
<td>Status data</td>
<td>Set passive mode - Event notification disable</td>
</tr>
<tr>
<td>SetnrN</td>
<td>Set number N=1,2,3,4</td>
<td>Status data</td>
<td>Set cell phone for alarm notification Send this SMS from cell phone for alarm notification</td>
</tr>
<tr>
<td>ClmrN</td>
<td>Clear number N=1,2,3,4</td>
<td>Status data</td>
<td>Clear cell phone for alarm notification</td>
</tr>
<tr>
<td>SettxZ,TEXT</td>
<td>Set text SMS</td>
<td>Z TEXT</td>
<td>Set text SMS: 01,02,03,04,05,06 - event digital input 1,2,3,4,5,6 07,08,09 - event anal.inp.1 (max, min, normal) 10,11,12 - event anal.inp.2 (max, min, normal) 13,14,15 - event anal.inp.3 (max, min, normal) 16,17,18 - event anal.inp.4 (max, min, normal)</td>
</tr>
<tr>
<td>FtrrF</td>
<td>F = 0.9 digital signal filter (in sec)</td>
<td>Status data</td>
<td>Set digital signal filter (0..5 sec)</td>
</tr>
<tr>
<td>PulseN,T</td>
<td>N = 1,2,3,4 T=0,1,2,...,9</td>
<td>Status data</td>
<td>Pulse output. N – output number, Pulse duration = T*2+1sec</td>
</tr>
</tbody>
</table>

**Note 1:** Not case sensitive. You can use GETST, Getst,
**Note 2:** If Max level = 00, then alarm for this level disable.
If Min level = 00, then alarm for this level disable.
## Output state (default)

<table>
<thead>
<tr>
<th>Output</th>
<th>Open Drain</th>
<th>Status</th>
<th>OUT=</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output 1</td>
<td>Open Drain</td>
<td>0 (Off)</td>
<td></td>
</tr>
<tr>
<td>Output 2</td>
<td>Open Drain</td>
<td>0 (Off)</td>
<td></td>
</tr>
<tr>
<td>Output 3</td>
<td>Relay NO</td>
<td>0 (Off)</td>
<td></td>
</tr>
<tr>
<td>Output 4</td>
<td>Open Drain</td>
<td>0 (Off)</td>
<td></td>
</tr>
</tbody>
</table>

## Not connected input state

<table>
<thead>
<tr>
<th>Input</th>
<th>Input state</th>
<th>Input state with pull-up resistor (J2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input 1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Input 2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Input 3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Input 4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Input 5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Input 6</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

## Active event on input

<table>
<thead>
<tr>
<th>Input</th>
<th>Input state on input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input 1</td>
<td>1-0</td>
</tr>
<tr>
<td>Input 2</td>
<td>1-0</td>
</tr>
<tr>
<td>Input 3</td>
<td>1-0</td>
</tr>
<tr>
<td>Input 4</td>
<td>1-0</td>
</tr>
<tr>
<td>Input 5*</td>
<td>1-0</td>
</tr>
<tr>
<td>Input 6*</td>
<td>1-0</td>
</tr>
</tbody>
</table>

Note *): only for version BR160SM-4A

## SMS Reporting Message

### Version BieneRemote160SM-2A/161SM-2A (with 2 analog event inputs)

<table>
<thead>
<tr>
<th>SMS Message Number (see command “Settx”)</th>
<th>SMS Message (see command “Settx”)</th>
<th>Cell Phone Number</th>
<th>Input Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Digital Event 1</td>
<td></td>
<td>Digital Input 1</td>
</tr>
<tr>
<td>1</td>
<td>Digital Event 2</td>
<td></td>
<td>Digital Input 2</td>
</tr>
<tr>
<td>2</td>
<td>Digital Event 3</td>
<td></td>
<td>Digital Input 3</td>
</tr>
<tr>
<td>3</td>
<td>Digital Event 4</td>
<td></td>
<td>Digital Input 4</td>
</tr>
<tr>
<td>4</td>
<td>A1 &gt; max</td>
<td></td>
<td>Analog Input 1</td>
</tr>
<tr>
<td>5</td>
<td>A1 &lt; min</td>
<td></td>
<td>Analog Input 1</td>
</tr>
<tr>
<td>6</td>
<td>A1 normal</td>
<td></td>
<td>Analog Input 1</td>
</tr>
<tr>
<td>7</td>
<td>A2 &gt; max</td>
<td></td>
<td>Analog Input 2</td>
</tr>
<tr>
<td>8</td>
<td>A2 &lt; min</td>
<td></td>
<td>Analog Input 2</td>
</tr>
<tr>
<td>9</td>
<td>A2 normal</td>
<td></td>
<td>Analog Input 2</td>
</tr>
</tbody>
</table>

See command "Setnr"
Version BieneRemote160SM-4A/161Sm-4A (with 4 analog event inputs)

<table>
<thead>
<tr>
<th>SMS Message Number (see command &quot;Settx&quot;)</th>
<th>SMS Message (see command &quot;Settx&quot;)</th>
<th>Cell Phone Number</th>
<th>Input Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Digital Event 1</td>
<td></td>
<td>Digital Input 1</td>
</tr>
<tr>
<td>02</td>
<td>Digital Event 2</td>
<td></td>
<td>Digital Input 2</td>
</tr>
<tr>
<td>03</td>
<td>Digital Event 3</td>
<td></td>
<td>Digital Input 3</td>
</tr>
<tr>
<td>04</td>
<td>Digital Event 4</td>
<td></td>
<td>Digital Input 4</td>
</tr>
<tr>
<td>05</td>
<td>Digital Event 5</td>
<td></td>
<td>Digital Input 5</td>
</tr>
<tr>
<td>06</td>
<td>Digital Event 6</td>
<td></td>
<td>Digital Input 6</td>
</tr>
<tr>
<td>07</td>
<td>A1 &gt; max</td>
<td></td>
<td>Analog Input 1</td>
</tr>
<tr>
<td>08</td>
<td>A1 &lt; min</td>
<td></td>
<td>Analog Input 1</td>
</tr>
<tr>
<td>09</td>
<td>A1 normal</td>
<td></td>
<td>Analog Input 1</td>
</tr>
<tr>
<td>10</td>
<td>A2 &gt; max</td>
<td></td>
<td>Analog Input 2</td>
</tr>
<tr>
<td>11</td>
<td>A2 &lt; min</td>
<td></td>
<td>Analog Input 2</td>
</tr>
<tr>
<td>12</td>
<td>A2 normal</td>
<td></td>
<td>Analog Input 3</td>
</tr>
<tr>
<td>13</td>
<td>A3 &gt; max</td>
<td></td>
<td>Analog Input 3</td>
</tr>
<tr>
<td>14</td>
<td>A3 &lt; min</td>
<td></td>
<td>Analog Input 4</td>
</tr>
<tr>
<td>15</td>
<td>A3 normal</td>
<td></td>
<td>Analog Input 4</td>
</tr>
<tr>
<td>16</td>
<td>A4 &gt; max</td>
<td></td>
<td>Analog Input 4</td>
</tr>
<tr>
<td>17</td>
<td>A4 &lt; min</td>
<td></td>
<td>Analog Input 4</td>
</tr>
<tr>
<td>18</td>
<td>A4 normal</td>
<td></td>
<td>Analog Input 4</td>
</tr>
</tbody>
</table>

See command "Setnr"

Phone numbers from which management is authorized
Delete all entry in active phone book and write 3 phone numbers of mobile phone numbers.

<table>
<thead>
<tr>
<th>location</th>
<th>Phone Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1 &lt;Phone number1&gt;*</td>
</tr>
<tr>
<td>2</td>
<td>A2 &lt;Phone number2&gt;*</td>
</tr>
<tr>
<td>3</td>
<td>A3 &lt;Phone number3&gt;*</td>
</tr>
</tbody>
</table>

Note 1: full phone number with country code

Example - enable 3 phone numbers for BieneRemote management

<table>
<thead>
<tr>
<th>location</th>
<th>Phone Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1 +3719106159</td>
</tr>
<tr>
<td>2</td>
<td>A2 +3716149759</td>
</tr>
<tr>
<td>3</td>
<td>A3 +3718398597</td>
</tr>
</tbody>
</table>

Example - enable all numbers (disable authorization numbers)

<table>
<thead>
<tr>
<th>location</th>
<th>Phone Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1 99</td>
</tr>
<tr>
<td>2</td>
<td>A2 &lt;Phone number2&gt;</td>
</tr>
<tr>
<td>3</td>
<td>A3 &lt;Phone number3&gt;</td>
</tr>
</tbody>
</table>
### BR160SM-4A and BR161SM-4A new version

<table>
<thead>
<tr>
<th>Event Input</th>
<th>Set Alarm Text SMS to EEPROM</th>
<th>Clear Alarm Text SMS</th>
<th>For 10 digital inputs</th>
<th>Default text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital 1</td>
<td>-4A (max 18 characters)</td>
<td>-4A</td>
<td>Input 1 event 0-1</td>
<td>Event INP1</td>
</tr>
<tr>
<td>Digital 2</td>
<td>Settx02,text2</td>
<td>Settx02</td>
<td>Input 2 event 0-1</td>
<td>Event INP2</td>
</tr>
<tr>
<td>Digital 3</td>
<td>Settx03,text3</td>
<td>Settx03</td>
<td>Input 3 event 0-1</td>
<td>Event INP3</td>
</tr>
<tr>
<td>Digital 4</td>
<td>Settx04,text4</td>
<td>Settx04</td>
<td>Input 4 event 0-1</td>
<td>Event INP4</td>
</tr>
<tr>
<td>Digital 5</td>
<td>Settx05,text5</td>
<td>Settx05</td>
<td>Input 5 event 0-1</td>
<td>Event INP5</td>
</tr>
<tr>
<td>Digital 6</td>
<td>Settx06,text6</td>
<td>Settx06</td>
<td>Input 6 event 0-1</td>
<td>Event INP6</td>
</tr>
<tr>
<td>Analog 1 &gt; MAX</td>
<td>Settx07, A1high</td>
<td>Settx07</td>
<td>Input 7 event 0-1</td>
<td>A1 &gt; Max</td>
</tr>
<tr>
<td>Analog 1 &lt; MIN</td>
<td>Settx08, A1low</td>
<td>Settx08</td>
<td>Input 7 event 1-0</td>
<td>A1 &lt; Min</td>
</tr>
<tr>
<td>Analog 2 &gt; MAX</td>
<td>Settx09, A1 normal</td>
<td>Settx09</td>
<td>Input 8 event 0-1</td>
<td>A2 &gt; Max</td>
</tr>
<tr>
<td>Analog 2 &lt; MIN</td>
<td>Settx10, A2 high</td>
<td>Settx10</td>
<td>Input 8 event 1-0</td>
<td>A2 &lt; Min</td>
</tr>
<tr>
<td>Analog 2 normal</td>
<td>Settx11, A2 low</td>
<td>Settx11</td>
<td>Input 8 event 1-0</td>
<td>A2 normal</td>
</tr>
<tr>
<td>Analog 3 &gt; MAX</td>
<td>Settx12, A3 high</td>
<td>Settx12</td>
<td>Input 9 event 0-1</td>
<td>A3 &gt; Max</td>
</tr>
<tr>
<td>Analog 3 &lt; MIN</td>
<td>Settx13, A3 low</td>
<td>Settx13</td>
<td>Input 9 event 1-0</td>
<td>A3 &lt; Min</td>
</tr>
<tr>
<td>Analog 3 normal</td>
<td>Settx14, A3 normal</td>
<td>Settx14</td>
<td>Input 9 event 1-0</td>
<td>A3 normal</td>
</tr>
<tr>
<td>Analog 4 &gt; MAX</td>
<td>Settx15, A4 high</td>
<td>Settx15</td>
<td>Input 10 event 0-1</td>
<td>LOW VOLTAGE</td>
</tr>
<tr>
<td>Analog 4 &lt; MIN</td>
<td>Settx16, A4 low</td>
<td>Settx16</td>
<td>Input 10 event 1-0</td>
<td>NORMAL VOLTAGE</td>
</tr>
<tr>
<td>Analog 4 normal</td>
<td>Settx17, A4 normal</td>
<td>Settx17</td>
<td>Input 10 event 1-0</td>
<td>NORMAL VOLTAGE</td>
</tr>
</tbody>
</table>