

GSM Controller BR161SM-2SMT-4A-A

Temperature, analog and digital version for green energy equipments.
GSM module for SMS remote monitoring and control applications

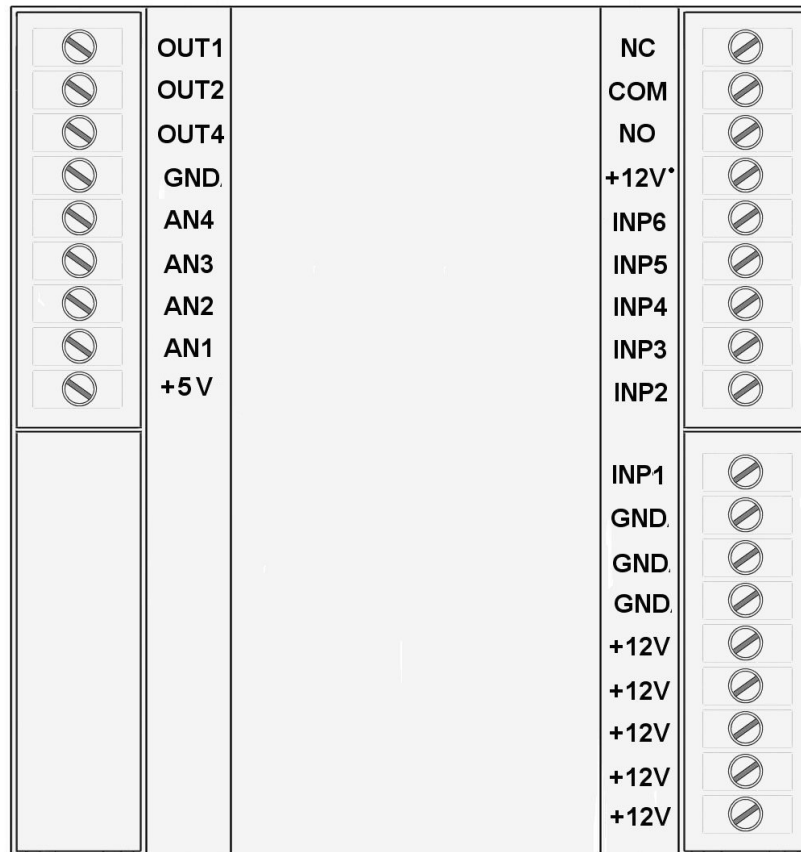


Features

- Internal 4-band GSM850/900/1800/1900 GSM-modem SIM800
- 4 digital input
- 2 SMT160-30 or SMT172 temperature sensor input (range -45 to +130°C)
- 3 analog inputs (AN1,2,3) for ACS712 +/-5A, +/-20A, +/-30A DC current sensor module (for DC current monitoring only) or for 0-10/0-5V analog input (selectable)
- 1 analog inputs (AN4) for battery voltage monitoring (up to 15VDC via external resistor) or internal BR160SM supply voltage (Jumper J0)
- 3 Open-Drain MOSFET output
- 1 Power Relay output for heater auto control
- Auto heater (Out.3) and air conditioner (Out.2) control
- Notification, control and configuration with SMS
- Timer output (output 1); output activation for from 1 to 99 min
- Internal control from digital inputs (timer output 1 activation for default duration)
- Operates from a 12VDC power source. It draws less than 40mA standby, 2A peak typ. 12VDC/1.2A minimum switching stabilized power supply is recommended. Power supply input has reverse polarity and over voltage protection.

Inputs and Outputs

Input	Name	
Digital inputs	Inp,1,2	Temperature sensor SMT160-30 T1, T2, result in °C
Digital inputs	Inp 3,4,5,6	Digital Inputs 3,4,5,6 (positive/negative level selectable with jumpers)
Analog inputs	AN1,AN2, AN3	1) Current sensor ACS712 +/-5A, +/-20A or +/-30A, result in A 2) 0-5V analog signal, (5V = 100%), result in % 3) 0-10V analog signal, (10V = 100%), result in %
Analog inputs	AN4	Battery voltage (15V maximum, via resistor 27k), result in V or internal jumper (see Jumper J0)



Preparation of SIM card

- 1) **Disable PIN code** request so it will not prompt for a PIN code on turning on.
- 2) Small SIM-card with 3V / 1,8V technology
- 3) SIM card change if power turn off.



LED indicators

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

Module LED indication (**Red LED**)

LED status	Modem status
Permanently off	Device off
Short blinking after power on and after 1 min periodic blinking	SIM card read process
Short blinking (period 5-6 sec)	Module in work
Permanently on	Module work with modem

GSM Modem LED indication (**Green LED**)

LED status	Modem status
Permanently off	Device off
Fast blinking (period 1s, ton 0,5s)	Net search / Not registered / Turning off
Slow blinking (period 3s, ton 0,3s)	Registered full service

Applications with

Current sensors

Current Sensor Module 30A Range ACS712T ELC-30A Module
Current Sensor Module 20A Range ACS712T ELC-20A Module
Current Sensor Module 5A Range ACS712T ELC-5A Module



for DC current monitoring only

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. of these sensors have jumper selectable input ranges **0-10, 0-20, 0-50A** or **0-100, 0-200, 0-250A**.



All

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



Temperature sensors

The **SMT160-30 (TO18 model)**

has an overall accuracy of 0.7 °C in the range from -30 °C to +100 °C and an accuracy of 1.2 °C from -45 to +130 °C.

The **SMT160-30 (TO220 model)**

has an overall accuracy of 1.7 °C in the range from -30 °C to +100 °C and an accuracy of 2 °C from -45 to +130 °C.



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

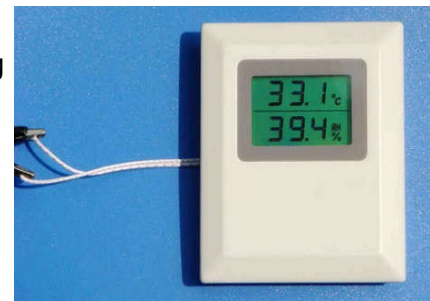
Accuracy for temperature: +-0.2Celsius(at 25Celsius)

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



Analog signal table

Battery voltage (Analog input 4), connection via serial resistor 27k (or internal voltage – set internal jumper 3)

Battery voltage V	analog.inp AN4 0-10V	Setpoint in %	Setpoint minimum	Setpoint maximum
0	0	0	disable	disable
9V	6	60		
10,2V	6,8	68	< 10,2V	
10,5	7	70	< 10,5V	
11,4	7,6	76	< 11,4V	
12	8	80		
13,2	8,8	88		
14,4	9,6	96		> 14,4V
14,7	9,8	98		> 14,7V
15	10	99		

Note: if set jumper J0 – AN4 = internal voltage; B = real voltage – 0,3V; AN4 = 8V

Current sensors (analog input AN1, AN2, AN3) - for DC current only

0-10V sensor V	0-20mA sensor mA	analog.input V (current sensor or 0-5V mode)	+/-5A sensor 185mV/1A	+/-20A sensor 100mV/1A	+/-30A sensor 66mV/1A	%	Setpoint minimum for 20A sensor	Setpoint maximum for 20A sensor	Setpoint minimum for 30A sensor	Setpoint maximum for 30A sensor
0	0	0		-25A	-37,9A	0				
1	2	0,5		-20A	-30,3A	10				
1,04	2,08	0,52			30A					
2	4	1		-15A	-22,7A	20	< -15A	> -15A	< -22,7A	> -22,7A
3	6	1	-5,4A	-10A	-15,1A	30	< -10A	> -10A	< -15,1A	> -15,1A
3,16	6,32	1,58	-5A							
4	8	2	-2,7A	-5A	-7,6A	40	< -5A	> -5A	< -7,6A	> -7,6A
4,8	9,6	2,4	-0,5A	-1A	-1,5A	48	< -1A	> -1A	< -1,5A	> -1,5A
4,9	9,8	2,45	-0,3A	-0,5A	-0,5A					
5	10	2,5	0	0	0	50	< 0A	> 0A	< 0A	> 0A
5,1	10,2	2,55	0,3A	0,5A	1,A		< +0,5A	> +0,5A	< +1A	> +1A
5,2	10,4	2,6	0,5A	1A	1,5A	52	< +1A	> +1A	< +1,5A	> +1,5A
6	12	3	2,7A	5A	7,6A	60	< +5A	> +5A	< +7,6A	> +7,6A
6,86	13,72	3,43	5A							
7	14	3,5	5,4A	10A	15,1A	70	< +10A	> +10A	< +15,1A	> +15,1A
8	16	4		15A	22,7A	80	< +15A	> +15A	< +22,7A	> +22,7A
8,96	17,92	4,48			30A					
9	18	4,5		20A	30,3A	90				
10	20	5		25A	37,9A	99				

Offset table

for fine zero level current sensor calibration (common for all current sensors)

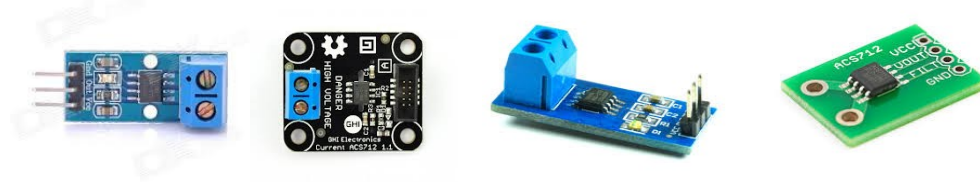
SMS command 2345ONN, NN = 00..99	Offset	Zero level in ADC	Offset in Amp for 20A sensor
	51	257	0,1
default	50	256	0
	49	255	-0,1

Compatible current sensors

ACS712: Fully Integrated, Hall-Effect-Based Linear Current Sensor IC

with 2.1 kVRMS Voltage Isolation and a Low-Resistance Current Conductor

<http://www.allegromicro.com/en/Products/Current-Sensor-ICs/Zero-To-Fifty-Amp-Integrated-Conductor-Sensor-ICs/ACS712.aspx>



Current Sensor Module 30A Range ACS712T ELC-30A Module

Current Sensor Module 20A Range ACS712T ELC-20A Module

Current Sensor Module 5A Range ACS712T ELC-5A Module

Current Sensor Module 20A Range ACS712T ELC-20A Module

- 1, the current sensor chips: ACS712ELC-20A;
- 2, pin 5V power supply, on-board power indicator;
- 3, the module can measure the positive and negative 20 amps, corresponding to the analog output 100mV / A;
- 4, no test current through the output voltage is $VCC / 2$;
- 5, PCB board size: 33 (mm) x14 (mm);

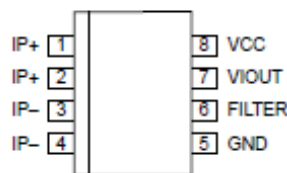
Note: ACS712 is based on the principle of the Hall test, please use this field to avoid impact

ACS712 Breakout x05B (5 Amp) version

<https://www.sparkfun.com/products/8882>

This is a breakout board for the fully integrated Hall Effect based linear ACS712 current sensor. The sensor gives precise current measurement for both AC and DC signals. Thick copper conductor and signal traces allows for survival of the device up to 5 times overcurrent conditions.

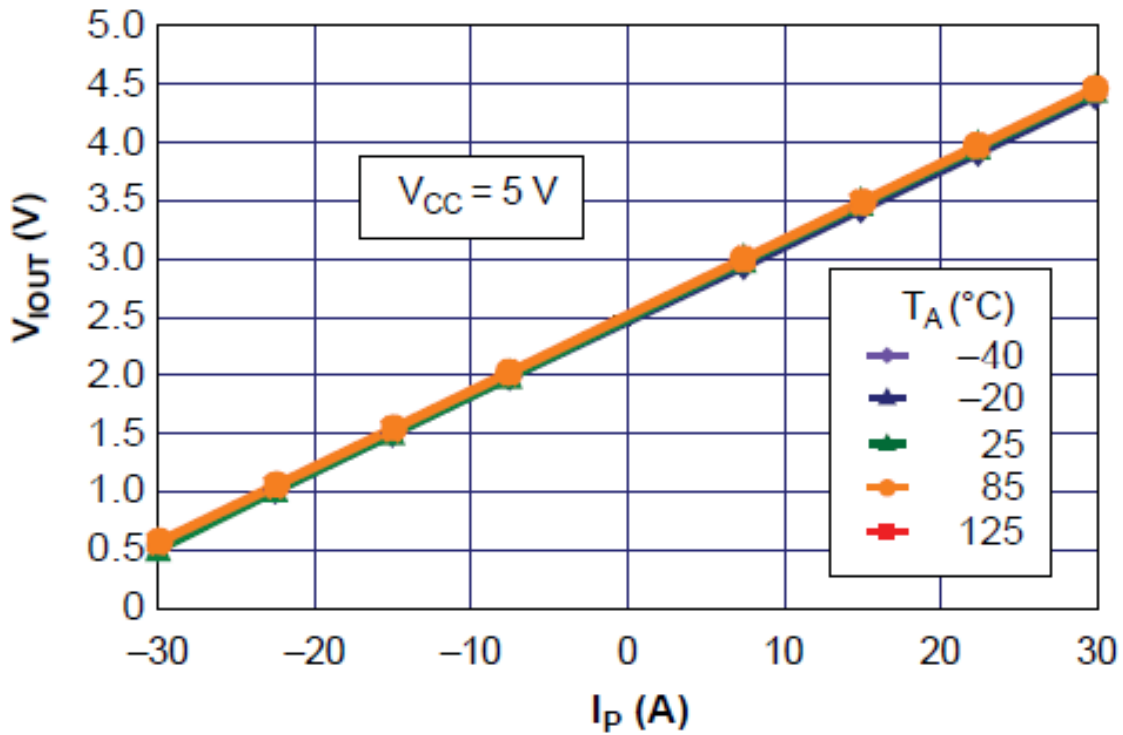
Pin-out Diagram



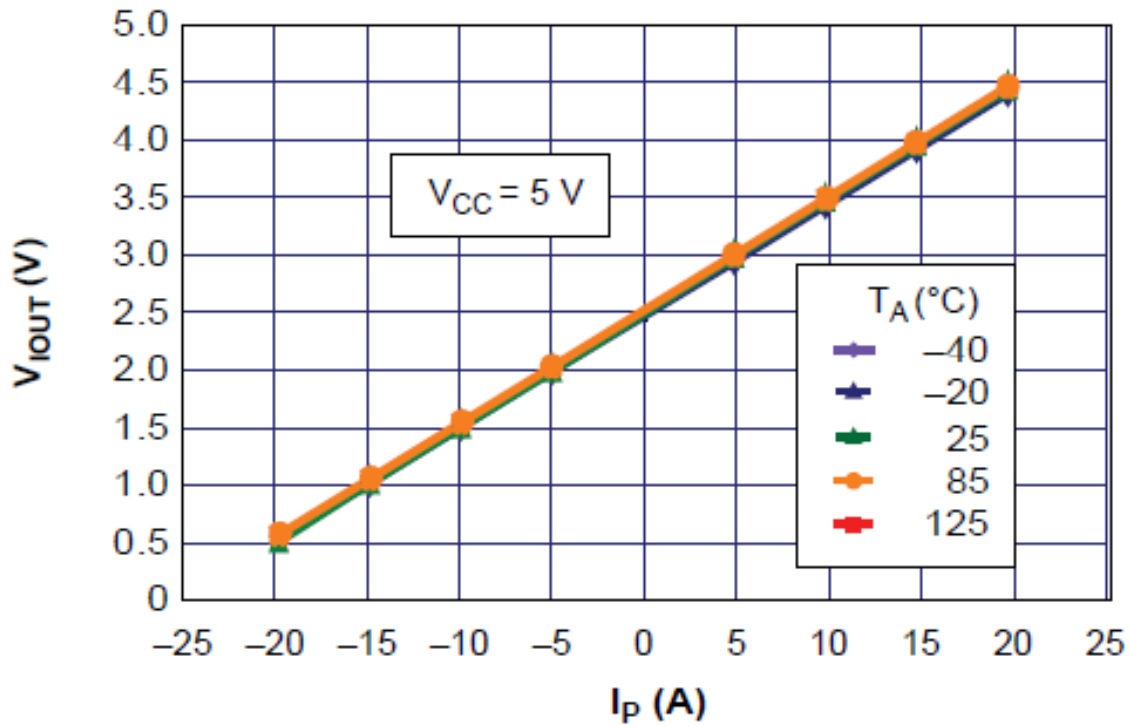
Terminal List Table

Number	Name	Description
1 and 2	IP+	Terminals for current being sampled; fused internally
3 and 4	IP-	Terminals for current being sampled; fused internally
5	GND	Signal ground terminal
6	FILTER	Terminal for external capacitor that sets bandwidth
7	VIOUT	Analog output signal
8	VCC	Device power supply terminal

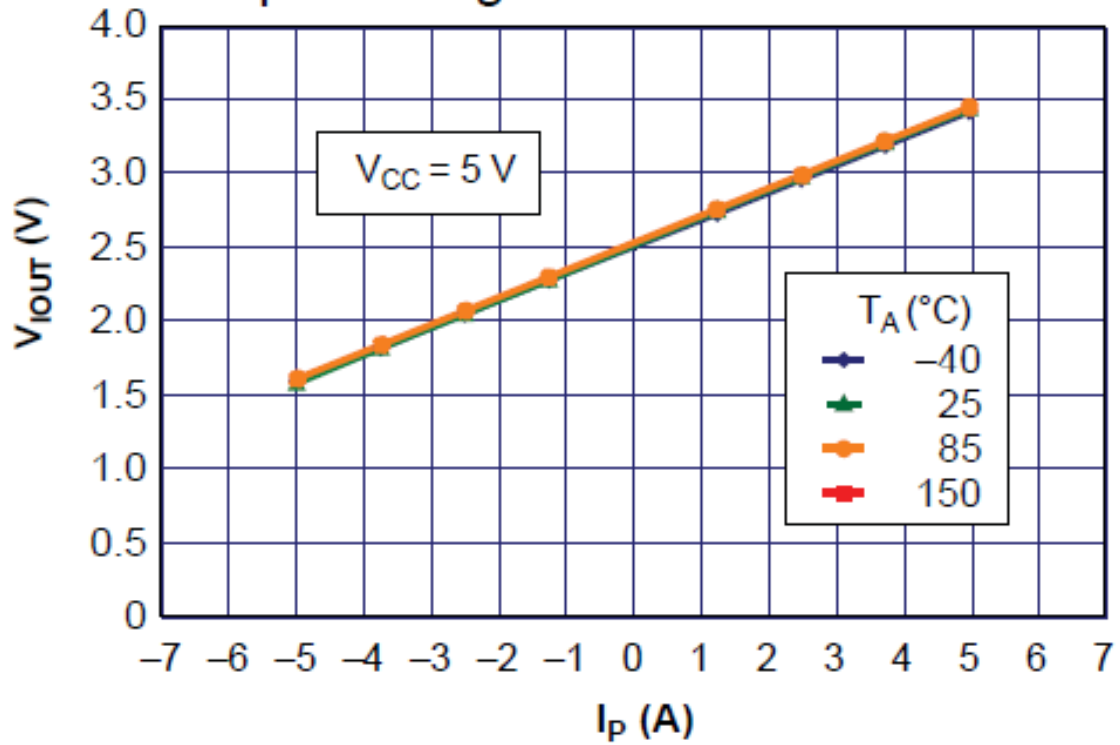
Output Voltage versus Sensed Current



Output Voltage versus Sensed Current



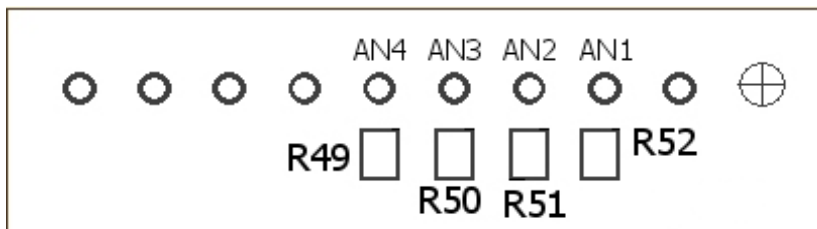
Output Voltage versus Sensed Current



For 0-10V, 0-5V, 0-20mA mode
(see SMS command 2345W)

You can set 0-10V or 0-5V or 0-20mA input AN1, AN2, AN3:separately.
For 0-20mA mode required change resistor.

See Figure bellow (bottom PCB side)



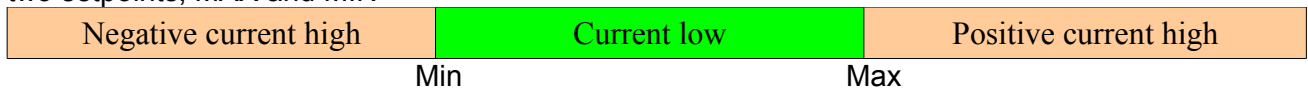
For this mode need add 249om resistor on bottom PCB side.

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

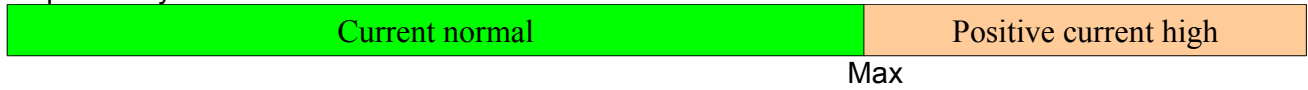
Setpoints

1) for current sensor

two setpoints, MAX and MIN



setpoint only MAX



setpoints only MIN



2) for analog signal

two setpoints, MAX and MIN



setpoint only MAX

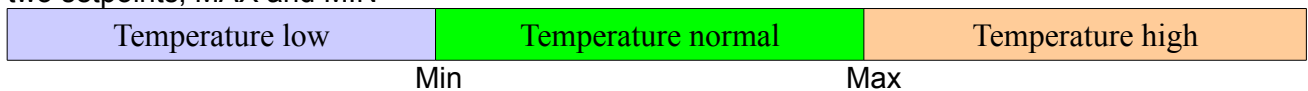


setpoints only MIN



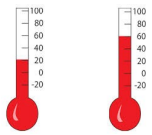


3) for temperature

two setpoints, MAX and MIN



Heater and air conditioner auto control

	Heater and air conditioner enable	Heater enable	Air conditioner enable	Both disable
Heater 	enable 2345A1 Temperature sensor T1 must be connected	enable 2345A1 default	disable 2345A0	disable 2345A0
Air Conditioner 	enable 2345A3 Temperature sensor T2 must be connected	disable 2345A2 default	enable 2345A3	disable 2345A2
	Temperature sensor T1 and T2 must be connected. Can also one temperature sensor connected to Dig.Inp.1 and Dig.Inp.2	Temperature sensor T1 must be connected	Temperature sensor T2 must be connected	(default)

Temperature Control in auto-mode; default – auto-mode disable.

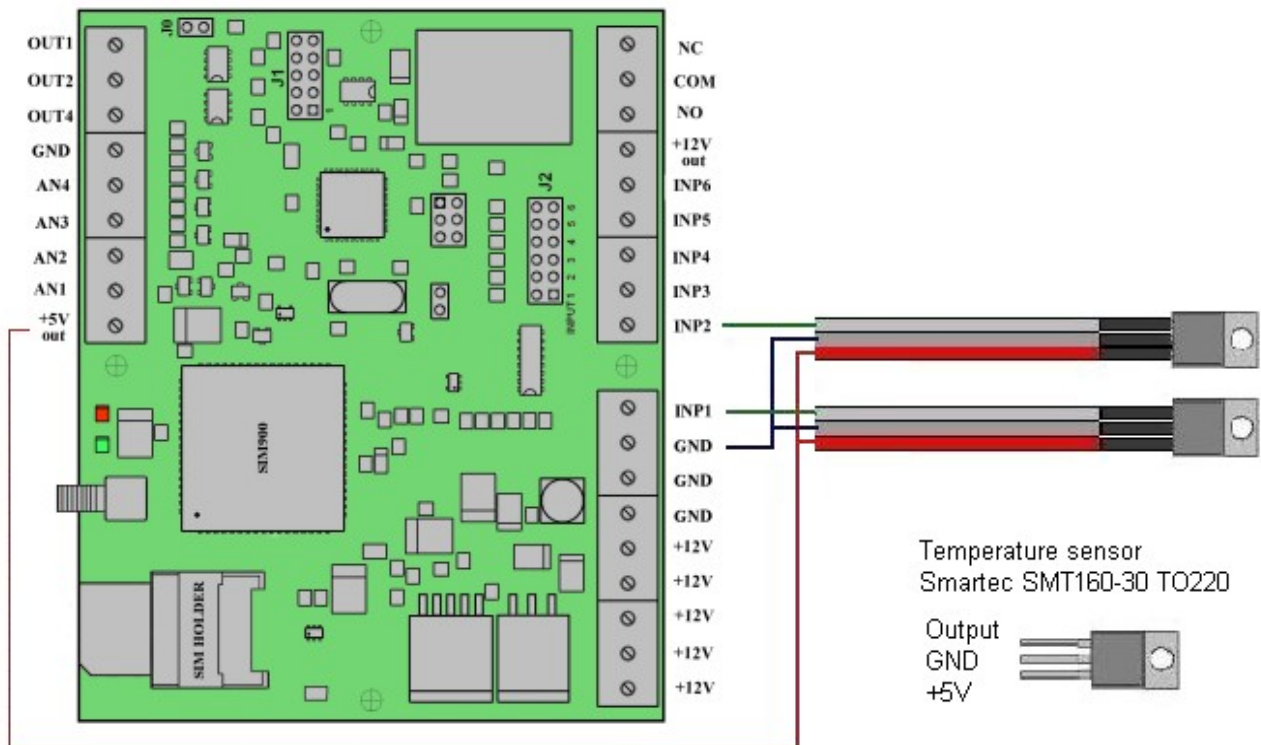
	Heater enable, air conditioner enable		direct output control	
T1 high	> +27 Celsius	Heater OFF	Output 1 auto-control	disable
T1 low	< +16 Celsius	Heater ON		
T2 high	> +29 Celsius	Air Condition ON	Output 2 auto-control	disable
T2 low	< +18 Celsius	Air Condition OFF		

	Heater enable, air conditioner disable		direct output control	
T1 high	> +27 Celsius	Heater OFF	Output 3 (previous version Output 1) auto-control	disable
T1 low	< +16 Celsius	Heater ON		
T2 high			Output 2 control with SMS	enable
T2 low				

	Heater disable, air conditioner enable		direct output control	
T1 high			Output 3 (previous version Output 1) control with SMS	enable
T1 low				
T2 high	> +29 Celsius	Air Condition ON	Output 2 auto-control	disable
T2 low	< +18 Celsius	Air Condition OFF		

Temperature sensor Smartec SMT160-30 connection

Smartec SMT160-30 (http://www.smartec.nl/temperature_sensor.htm) is a three terminal integrated temperature sensor, with a duty-cycle output. Temperature sensor connected to Digital Input1 and Digital Input2.



Technical specifications of the SMT160-30 – <http://www.smartec.nl/pdf/DSSMT16030.PDF>

The **SMT160-30 (TO18 model)** has an overall accuracy of 0.7 °C in the range from -30 °C to +100 °C and an accuracy of 1.2 °C from -45 to +130 °C.
The **SMT160-30 (TO220 model)** has an overall accuracy of 1.7 °C in the range from -30 °C to +100 °C and an accuracy of 2 °C from -45 to +130 °C.



Note:

If use long cable for Smartec SMT160-30 temperature sensor, connect sensor side between GND and +5V pins ceramic capacitor 0.1mkF.

TEMPERATURE Probe with shielded cable

TEMPERATURE Probe Assembly SMTRVS1801
http://www.smartec.nl/temperature_probe.htm

Sensor: SMT160-30 TO18
Probe: stainless steel tube 7 mm. x 40 mm.
Cable: 5 m. PVC shielded, 3.5 mm.
Connections:
Brown: Vcc
White: Output
Green: Gnd



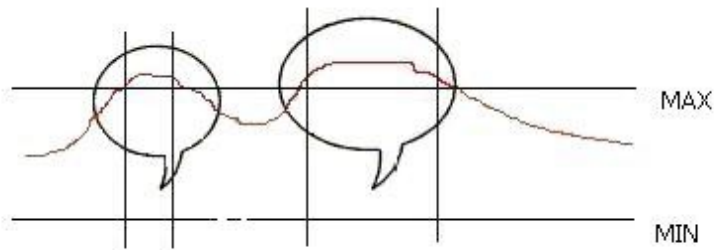
bSMT1603018 temperature probe

Sensor: SMT160-30 TO18
Cable: 5 m. shielded
Connections:
Red: Vcc 5VDC
Yellow: Output
Blue: Gnd



Temperature (timeout) filter

2345Ft
where t =
0: 30sec,
1: 5min
...
9: 45min;



SMS command

SMS command	Answer SMS	Function
Temperature control and monitoring		
2345L1+16 2345L2+18	(setpoints info)	Set minimum temperature level in °C default: T1:+16, T2:+18
2345H1+27 2345H2+29		Set maximum temperature level in °C default: T1:+27, T2:+29
2345A0 2345A1 2345A2 2345A3 2345A4	(information)	0-Disable auto heater control, 1-Enable auto heater control, 2-Disable auto air condition control, 3-Enable auto air condition control, 4-Disable heater and air condition. control default: Disable auto heater and air condition control
2345F1	(setpoints info)	Timeout filter for temperature 0: 30sec, 1: 5min ... 9: 45min; default 0
Enable alarm SMS / disable alarm SMS (for digital inputs only)		
2345E	OK	Enable alarm SMS, default enable (after restart - enable)
2345B	OK	Disable alarm SMS
Get information		
2345i	(information) T1=+22 T2=+23 I3=0 I4=0 I5=0 I6=0 O1 OFF, O2 OFF, O3 OFF, O4 OFF A1=0 A2=0 A3=0 A4=0 AUTO: heater, cond.. D=15	Read information – temperature in °C input output analog Auto mode Out1 timer duration (prev. version Out.3)
Set/Reset Outputs; Timer Outputs; only for Output 1 (previous version Out.3)		
2345S1 ... 2345S4	(information)	Set output **)
2345R1 ... 2345R4	(information)	Reset output **)
2345V30	(information)	set duration for timeout = 30 min (default 15 min)
2345T60 2345T	(information)	set Out1 for timeout = 60 min default timeout = 15 min set Out.1 for timeout = default ***) (prev. version Out.3)
2345Kn	OK	Internal control from digital inputs 3,4,5,6; internal control enable, then if event on digital input, start Out.1 (previous version Out.3) ON on default time (see SMS command T) n = 0,1,2...9; 0: disable; 1: enable for Inp.3; 2: enable for Inp.4, 4: enable for Inp.5; 8: enable for Inp.6 (table on page 17)

Phone Numbers for alarm SMS		
2345N1 ... 2345N4	OK	Set number for alarm SMS at position 1..4
2345C1 ... 2345C4	OK	Clear number at position 1..4 for alarm SMS
Alarm SMS text setting		
2345X06, Input 06 2345X22	6:Input 06	Set text message for temperature 1 and 2 events, analog 1 ... 4 and for inputs 3...6. Text up to 14 characters (Text SMS message table on page 16) Clear text
Analog Inputs (AN1,AN2,AN3 – current sensor, AN4 – external voltage 0-15V)		
2345M1,35 2345M4,40	(setpoints info)	Set setpoints for minimum analog level for A1,A2,A3,A4 in % (table page 4) default: AN1,AN2,AN3 = 0%, AN4 = 60%
2345Y1,65 2345Y4,60	(setpoints info)	Set setpoints for maximum analog level for A1,A2,A3,A4 in % (table page 6) default: AN1,AN2,AN3 = 0%, AN4 = 95%
2345U	(setpoints info) T1:+18+23 T2:+18+23 F: 0 A1:35 65 A2:00,00 A3:00 00,A4:00 00 223	Get setpoints temperature setpoints temperature timeout filter analog setpoints analog inputs mode
2345O51	(information)	Set zero offset for current (AN1, AN2, AN3) 00..99 (see offset table on page 6)
2345W523	(setpoints info)	Set current sensor for AN1,2,3 individual 5 – +/-5A current sensor 2 – +/-20A current sensor 3 – +/-30A current sensor 1 – 0-10V analog input (10V = 100%) 0 – 0-5V analog input (5V = 100%) or 0-20mA input (20mA = 100%) (default 000)
Password change		
2345P2010	Psw: 2010	Change password; use only 0,1,2,3,4,5,6,7,8,9 default password 2345 if you forgot password, use jumper for restore default password 2345 (see paragraph JUMPERS)

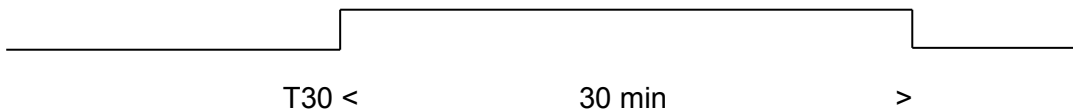
- *) if auto-control enabled - answer SMS - 'Disable'
- ***) direct control disabled for Out.3 (previous version Out.1) if heater enabled
direct control disabled for Out.2 if air condition enabled
- ***) You can set Output 1 (previous version Out.3) for time from 1 to 99 min.

Text SMS message

Auto mode	Heater and air conditioner enable	Heater enable	Air conditioner enable	Both disable
SMS command	Text (length 14 char)	Text (length 14 char)	Text (length 14 char)	Text (length 14 char)
2345X01,	Temp.1 high	Temp.1 high	Temp.1 high	Temp.1 high
2345X02,	Temp.1 low	Temp.1 low	Temp.1 low	Temp.1 low
2345X03,	Temp.1 normal	Temp.1 normal	Temp.1 normal	Temp.1 normal
2345X04,	Temp.2 high	Temp.2 high	Temp.2 high	Temp.2 high
2345X05,	Temp.2 low	Temp.2 low	Temp.2 low	Temp.2 low
2345X06,	Temp.2 normal	Temp.2 normal	Temp.2 normal	Temp.2 normal
2345X07,	Input 3	Input 3	Input 3	Input 3
2345X08,	Input 4	Input 4	Input 4	Input 4
2345X09,	Input 5	Input 5	Input 5	Input 5
2345X10,	Input 6	Input 6	Input 6	Input 6
2345X11,	Analog 1 high	Analog 1 high	Analog 1 high	Analog 1 high
2345X12,	Analog 1 low	Analog 1 low	Analog 1 low	Analog 1 low
2345X13,	Analog 1 normal	Analog 1 normal	Analog 1 normal	Analog 1 normal
2345X14,	Analog 2 high	Analog 2 high	Analog 2 high	Analog 2 high
2345X15,	Analog 2 low	Analog 2 low	Analog 2 low	Analog 2 low
2345X16,	Analog 2 normal	Analog 2 normal	Analog 2 normal	Analog 2 normal
2345X17,	Analog 3 high	Analog 3 high	Analog 3 high	Analog 3 high
2345X18,	Analog 3 low	Analog 3 low	Analog 3 low	Analog 3 low
2345X19,	Analog 3 normal	Analog 3 normal	Analog 3 normal	Analog 3 normal
2345X20,	Battery high	Battery high	Battery high	Battery high
2345X21,	Battery low	Battery low	Battery low	Battery low
2345X22,	Battery normal	Battery normal	Battery normal	Battery normal
Default for current sensors (AN1, AN2, AN3)				
2345X11,	I1 pos. high	I1 pos. high	I1 pos. high	I1 pos. high
2345X12,	I1 neg. high	I1 neg. high	I1 neg. high	I1 neg. high
2345X13,				
2345X14,	I2 pos. high	I2 pos. high	I2 pos. high	I2 pos. high
2345X15,	I2 neg. high	I2 neg. high	I2 neg. high	I2 neg. high
2345X16,				
2345X17,	I3 pos. high	I3 pos. high	I3 pos. high	I3 pos. high
2345X18,	I3 neg. high	I3 neg. high	I3 neg. high	I3 neg. high
2345X19,				
Default for battery voltage (AN4)				
2345X20,	Battery high	Battery high	Battery high	Battery high
2345X21,	Battery low	Battery low	Battery low	Battery low
2345X22,	Battery normal	Battery normal	Battery normal	Battery normal

Timer Output

Timer output for Output 1 (previous version Out.3). Output ON for time duration (SMS command 2345T and D).

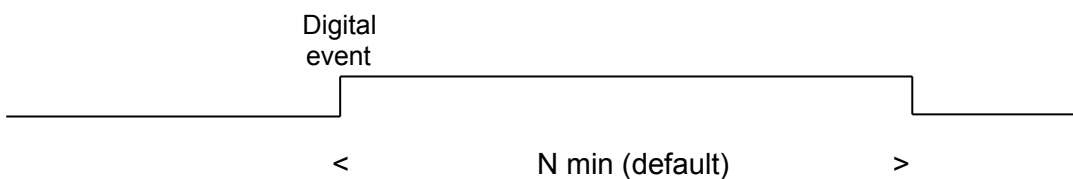


Internal Control

Internal control for set Output 1 (previous version Out.3) ON on duration time (= SMS command 2345D)

if event digital input. 1,2,3,4,5,6 (SMS command 2345K)

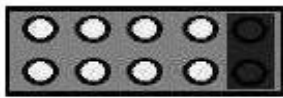
SMS command	Digital Input	6	5	4	3	Internal control with Out.1 on default time
2345K0		0	0	0	0	disable
2345K1		0	0	0	1	Out.1 ON if event digital input 3
2345K2		0	0	1	0	Out.1 ON if event digital input 4
2345K3		0	0	1	1	Out.1 ON if event digital input 3 and 4
2345K4		0	1	0	0	Out.1 ON if event digital input 5
2345K5		0	1	0	1	Out.1 ON if event digital input 3 and 5
2345K6		0	1	1	0	Out.1 ON if event digital input 4 and 5
2345K7		0	1	1	1	Out.1 ON if event digital input 3, 4 and 5
2345K8		1	0	0	0	Out.1 ON if event digital input 6
2345K9		1	0	0	1	Out.1 ON if event digital input 3 and 6



For example – if motion detector active – Out.1 ON for N min (N = 01..99 min, see SMS command 2345V). To Out.1 you can connect car DVR or Siren. (previous version Out.3)

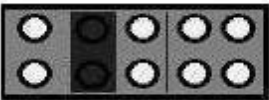
Jumpers

Jumper J1



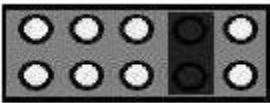
J1 **Change event 0-1 / 1-0 for digital input**
jumper set - 0-1 event

Set password default (2345) -



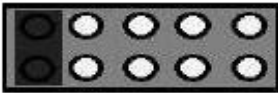
J1 after 5 sec - power off, remove jumper.

Inp.6 event inversion (only in last version)



J1 Set jumper for Inp.6 inversion for event 0-1 / 1-0

Set Band



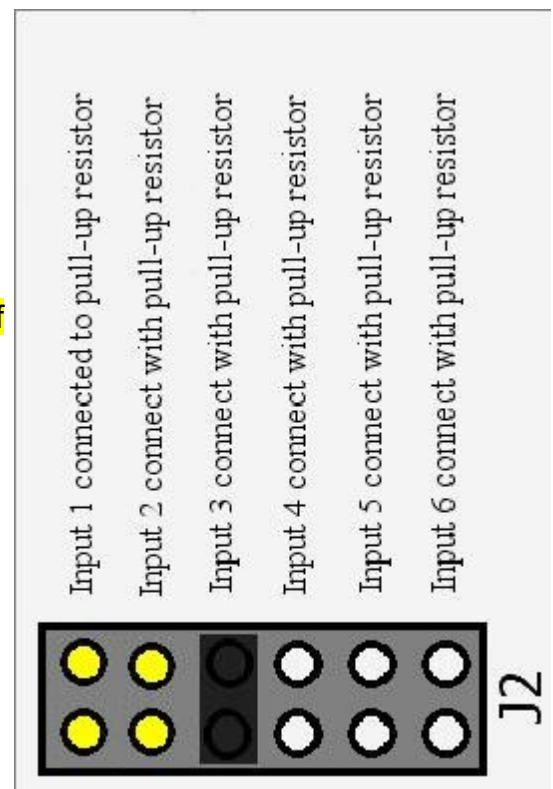
J1 Jumper set – 850+PCS mode
Jumper unset – ALL BAND mode

Jumper 2

Jumpers for pull-up resistor setting

only for digital inputs 3,4,5,6

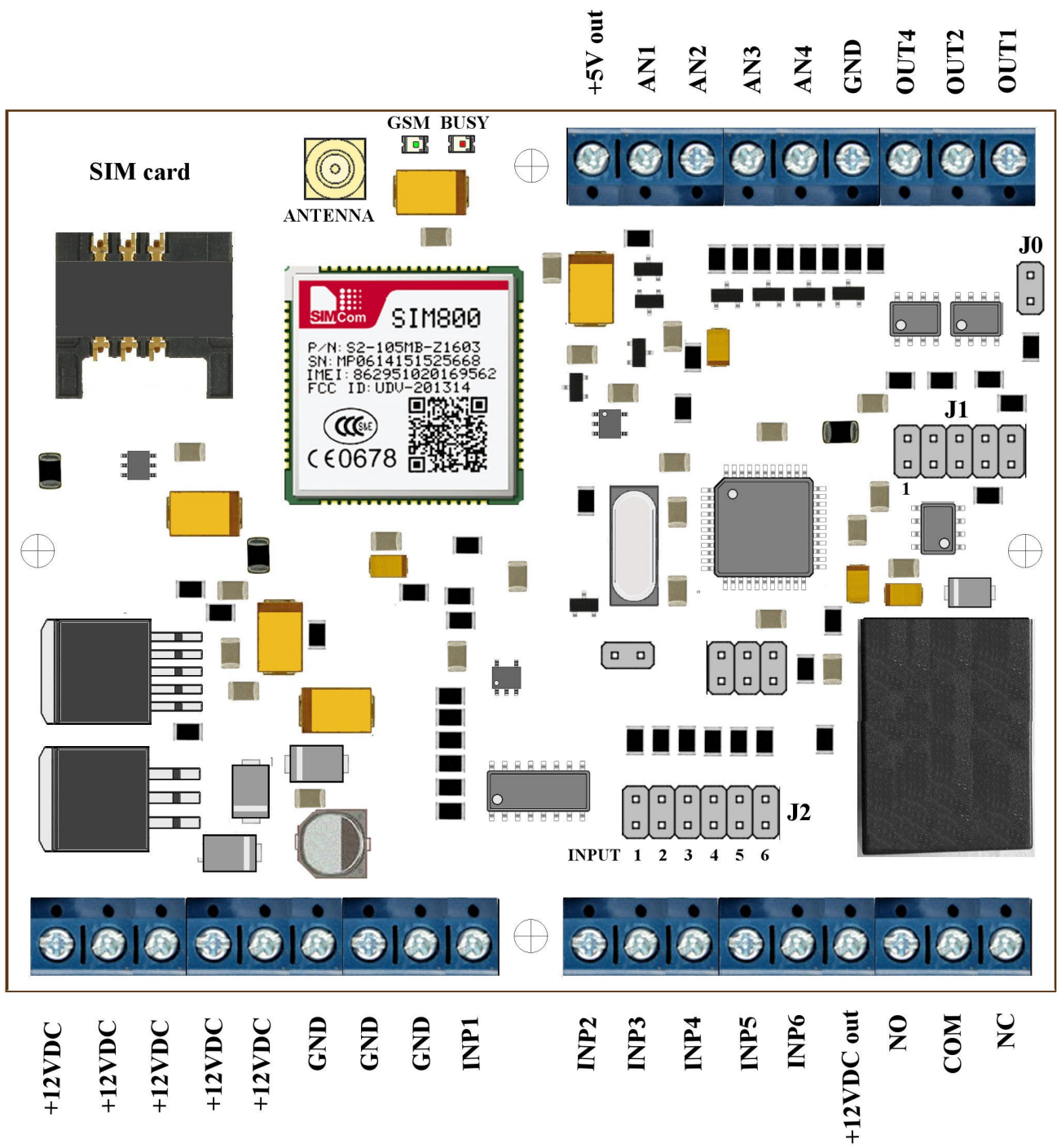
Not use jumper for input 1 and 2. Input 1 and 2 – for temperature sensor. Temperature sensor will broken if you set jumpers for inputs 1 and 2.



Jumper 0 (see figure next page)

Connection to analog input 4 internal supply voltage. Voltage will be at less than 0,3V.
If Jumper J0 set, on AN4 = 8V.

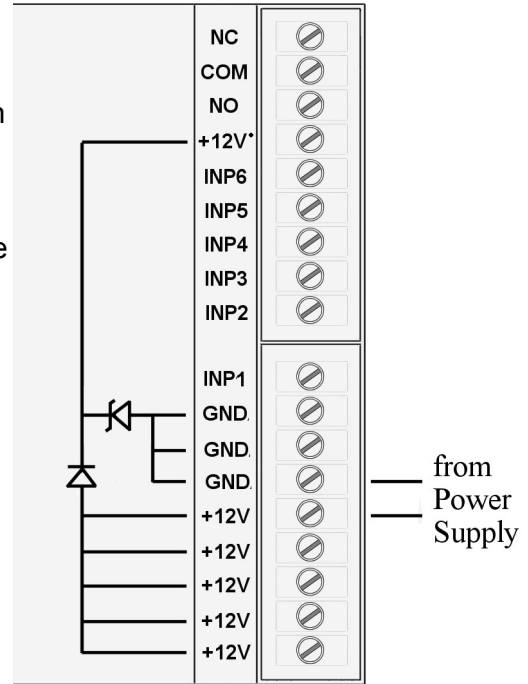
BR160SM board



Power Supply connection

+12VDC stabilised Power Supply must be connected with screw terminal block.
 We recommend use stabilised 1,7...2.5A 12VDC power supply.
 Power supply input has negative voltage and over voltage protection.

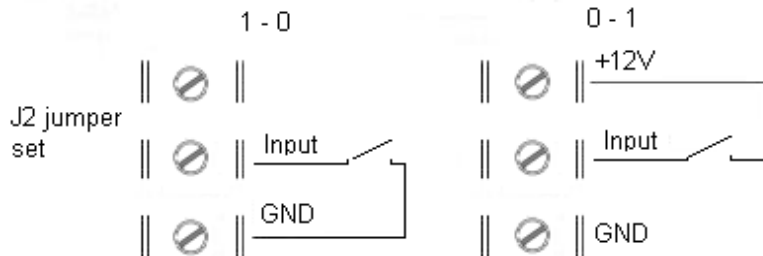
Internal +12VDC connection and Power Supply connection schematic.



Connection Example

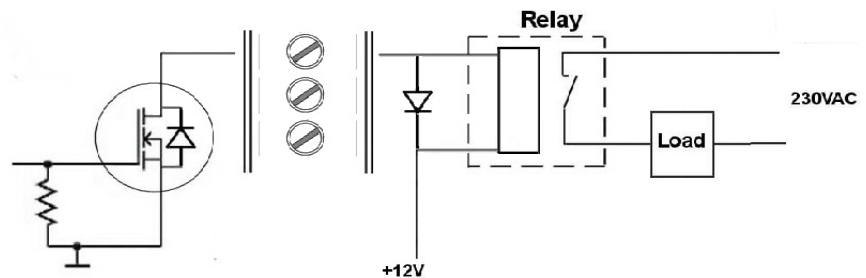
Connection example to Input Driver (Input 1-5)

1-0 and 0-1 event notification
 You can use J2 pin header for in-board pull-up resistor connection.

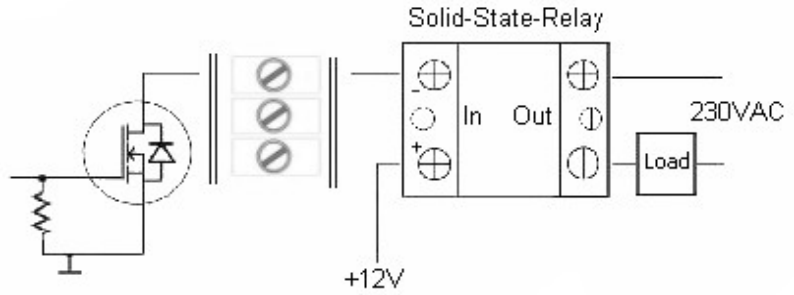


Relay connection example to Output Driver (Output 1, 2 and 4)

Electromechanical relay connection.



Solid-state-relay (SSR) connection.



Inputs / Outputs Schematic

Inputs

Digital Transistor Inputs

Connector: Screw terminal block

Inversion: Yes

Protection: Yes

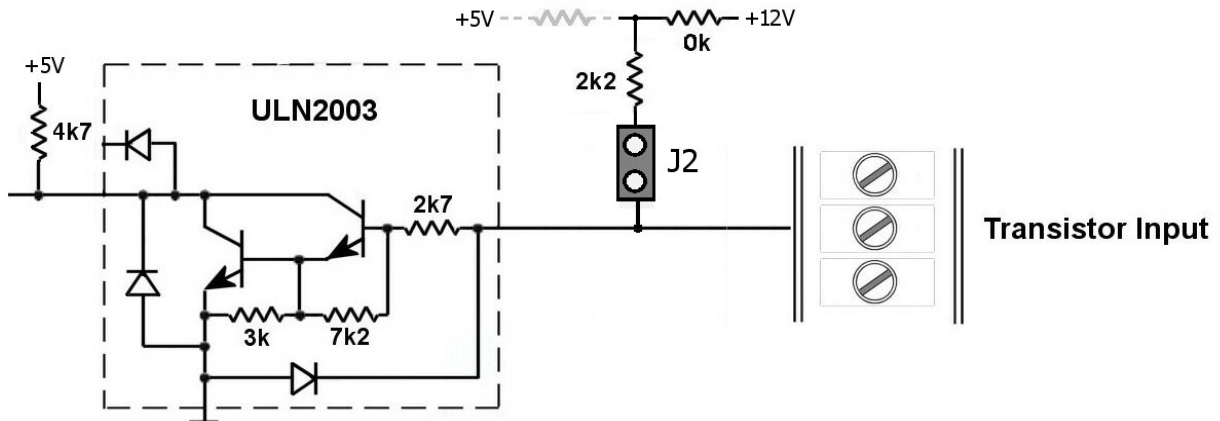
Max input voltage: +12V without external limited resistor.

Free Input: logic "0"

Logic "0": 0V...+1V

Logic "1": +1.5V...+12V

J2 jumper – for pull-up resistor connections to +12V (+5V optional)



0-10V / 0-5V Analog Inputs

Connector: Screw terminal block

Input type: CMOS

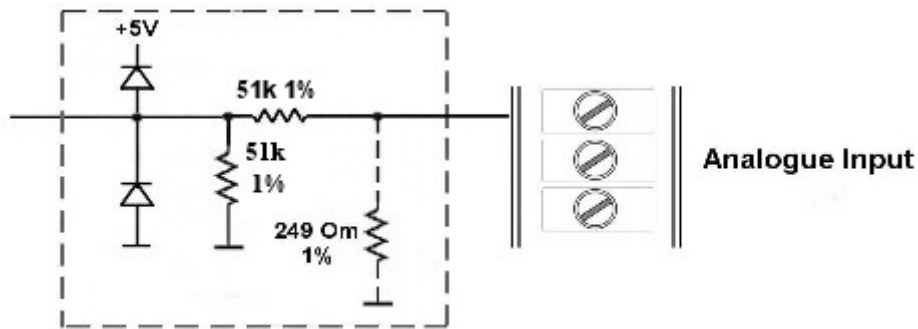
Input Voltage: 0 to +10V

Maximum input voltage: 10VDC

Input impedance: 100 K Ω .

ADC resolution: 10-bit

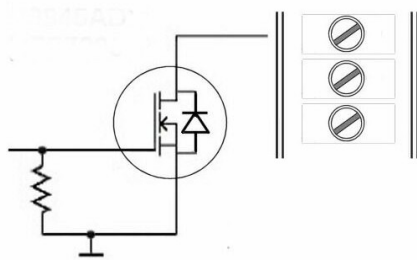
249 Ω resistor – optional for 0-20/4-20mA applications



Outputs

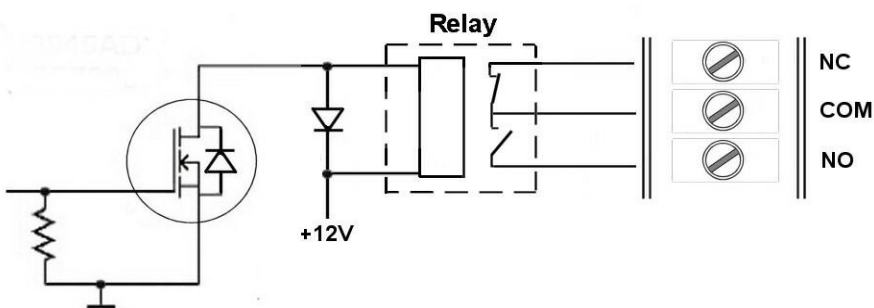
MOSFET Open Drain Outputs

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



Relay Output

Connector: Screw terminal block
 Outputs: NO/COM/NC
 Relay: SPDT power relay LEG-12F
 Min load: 0.1 A, 5VDC
 TUV - 7A resistive- 240VAC / 24VDC



Technical Specification

Hardware Specification

	BR160SM-2SMT-4A-A
GSM band support	GSM850/900/1800/1900
Internal GSM modem	SIM800
RF Transmit Power	Class 4 (2W) 900Mhz, Class 1 (1W) 1800Mhz, 1900Mhz
Command and data transmission	SMS
SIM card reader	Yes
SIM card type	Phase 1 and phase 2+; SIM 3V / 1.8V
Antenna Connection	50Ω SMA (f) Connector
Firmware	Yes
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	4
- Events digital inputs	4
- Digital inputs event	0-1 or 1-0
- 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 - 2°C
Protection	Yes
Analog inputs	
Number of analog inputs	3+1
- Maximum voltage	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/ 5A TUV - 7A resistive- 24VDC
- Digital output control	On-Off; Pulse (Standard and Gate version only)
Timer output	Yes, Output 1 (previous version Output 3)
Wiring	
Wiring Connections	Screw terminal blocks
Power Supply	
Required Power supply	External +12 VDC stabilised 1,2A minimum 12VDC (14.5VDC max.)
Power requirement	1.2A minimum, 2A peak during transmission (14.5VDC max.)
Power consumption	40mA in idle mode, 100mA peak in SMS transmit mode
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 (SIM300 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	75 g

Firmware Specification

	BR160SM-2SMT-4A-A
Number of controlled outputs	4
Timer output	Output 1 (previous version Output 3)
Inputs for temperature sensor SMT160-30	2
Digital event inputs	4
Analog event inputs	4
Events cell phone numbers	4
SMS events format	Text message
SMS message format for analog data	In A,V %, setpoints 00 - 99%
SMS message format for temperature data	° C measurement temperature range -45° C - +135° C min level, normal, max level event temperature range -45° C - +99° C