
	Subject: External Smart Meter Module	Page: 1/10
	Type: EM1805-J25-GS	

1. Introduction

EM1805 is an electronic meter control module operated by batteries. It can be retrofitted onto various types and brands of domestic gas meters.

EM1805 is capable of reading pulse signals from meters, converting them into digital indexes, and transmitting them to the main server over a GSM network.

EM1805 can be remotely controlled via highly sophisticated software.

EM1805 features different operating modes, enabling it to shut-off gas flow based on specific consumption criteria or via a direct shut-off command using its built-in DC motor-valve.





2. Technical Features

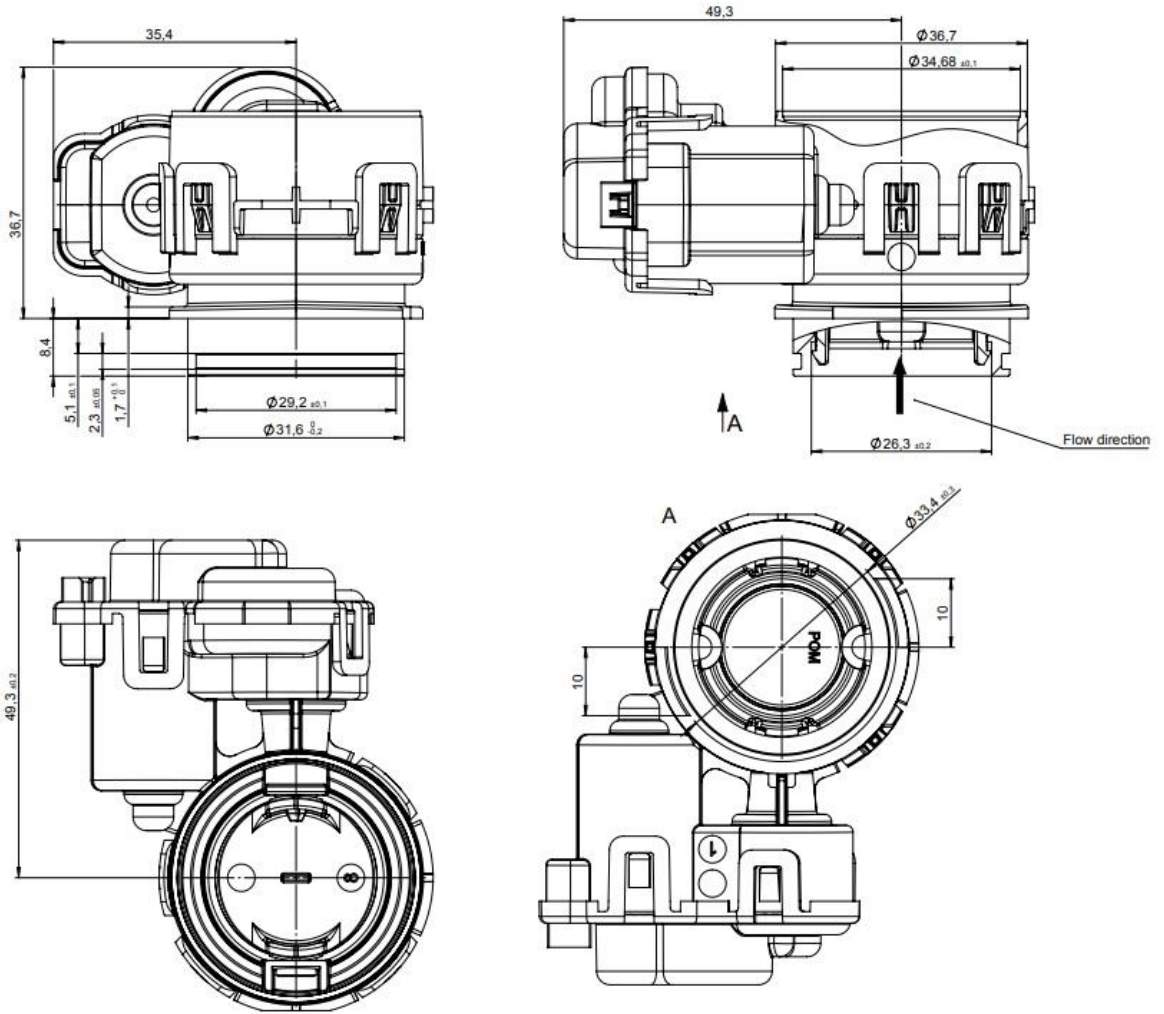
2.1. DC Motor Valve

Manufacturer	Johnson Electric
Product	ZGV2 Gas Shut-off Valve
Meter Size	G4 – G6
ATEX Class	II 3G Ex IIA T3 X
Operating Temp.	-25C....+60C
Storage Temp.	-25C....+70C
Life Time	≥ 10 years / ≥4.000 cycle
Operating pressure	< 75 mbar (7,5 kPa)
Maximum pressure	500 mbar (50 kPa)
Maximum flow rate	≤ 10 m ³ /h
External leakage (20°C)	< 1,0 l/h at operating pressure < 5,0 l/h at maximum pressure
Pressure drop	< 0,2 mbar (20 Pa) at 6 m ³ /h and 75 mbar (7,5 kPa)
Closing speed	~ 15 sec. at 2,8 V
Nominal voltage	2,8 V ... 3,6 V



	Subject: External Smart Meter Module	Page: 2/10
	Type: EM1805-J25-GS	

Johnson Electric ZGV2 Gas Shut-off Valve Dimension

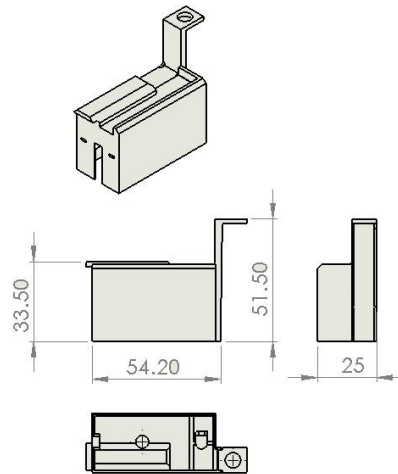


2.2. LFTP (Low Frequency Pulse Transmitter)

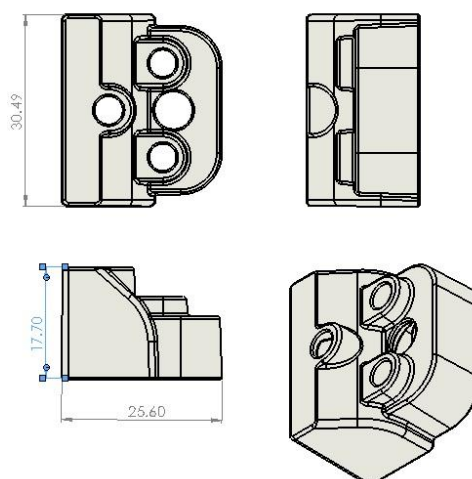
Read Switch		Tampering Switch	
Contact Rating max	10W	Contact Rating max	10W
Switching Voltage max	200 VDC	Switching Voltage max	200 VDC
Breakdown Voltage min	250 VDC	Breakdown Voltage min	250 VDC
Switching Current max	0.5 A	Switching Current max	0.5 A
Carry Current max	1.0 A	Carry Current max	1.25 A
Contact Resistance	0.1 Ω	Contact Resistance	0.1 Ω
Operation Temp.	-40 C....+250 C	Operation Temp.	-40 C....+80 C

Available Meters



Elster



Natek



LFTP available for other meter brands.
Sample meter required prior to ordering.

	Subject: External Smart Meter Module	Page: 4/10
	Type: EM1805-J25-GS	

2.3. Battery

EM1805 requires;

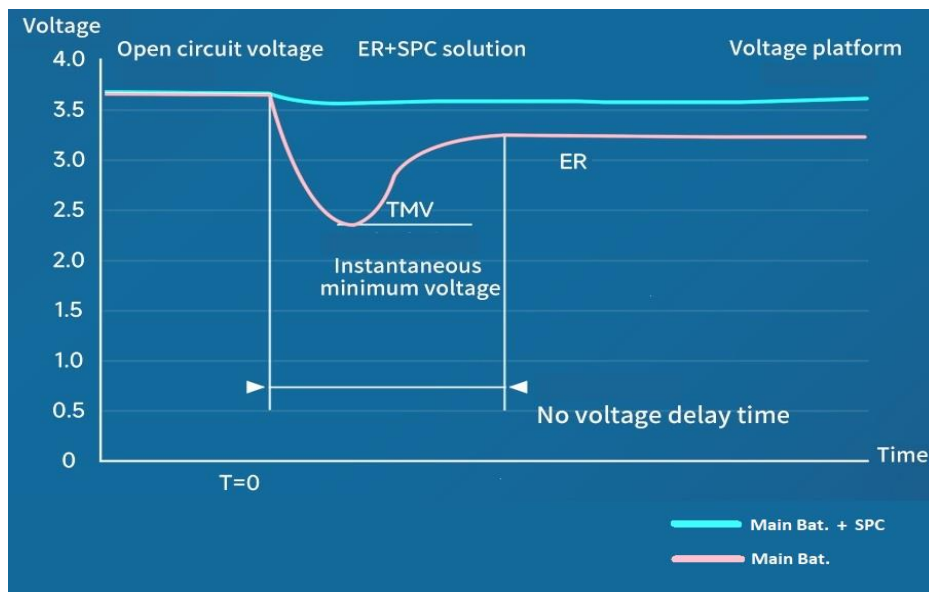
- 2000 mA pulse current and 3.2 V for GPRS connection
- 1200 mA pulse current and 2.8 V for NB-IOT connection



Main Battery	D Size
Manufacturer	EVE
Voltage	3.6 V
Capacity	19000 mAh
Max.Pulse Current	400 mA
Operating Temp.	-60 C....+85 C

A tantalum capacitor is integrated onto the main board of the EM1805 to ensure sufficient power for the GSM layer in scenarios where only the main battery is utilized. The maximum pulse current of the main battery alone is insufficient for standalone operation of the GSM connection.

A battery package with an integrated supercapacitor alongside the main battery is strongly recommended. As illustrated in the diagram below, Main Battery + Supercapacitor (SPC) package will provide continuous voltage and current supply.

* Supercapacitor (optional)	
Manufacturer	EVE
Max.Pulse Current	2000 mA
Operating Temp.	-40 C....+85 C





	Subject: External Smart Meter Module	Page: 5/10
	Type: EM1805-J25-GS	

2.4. Communication

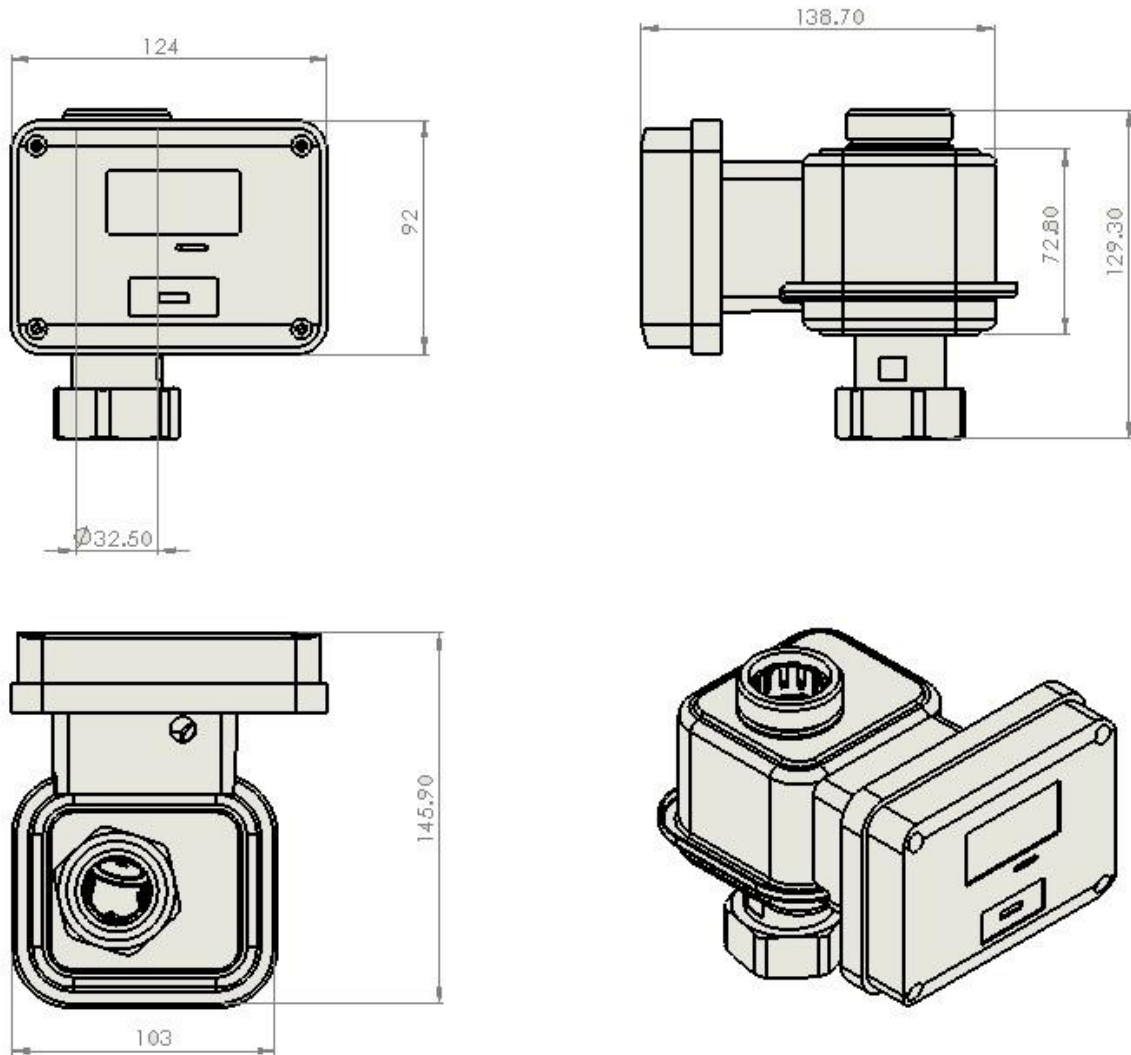
Manufacturer	SIMCOM
Product	7672FASE
Operating Temp.	-40 C...+85C
Bands	GPRS 4G (LTE)
Supply Voltage	3.4 – 4.2 V
Interface	SIM / UART / USB / ADC / PCM / GPIO / 12C
Power Consumption	TBD



Manufacturer	SIMCOM
Product	7022
Operating Temp.	-40 C...+85C
Bands	NBIOT (LTE)
Supply Voltage	2.1 – 4.3 V
Interface	USIM / UART / WARKUP / ADC / Netlight / GPIO / ADC / RI
Power Consumption	TBD – PSM : 0.8 microA

	Subject: External Smart Meter Module	Page: 6/10
	Type: EM1805-J25-GS	

2.5. General Features



2.5.1. Dimension



	Subject: External Smart Meter Module	Page: 7/10
	Type: EM1805-J25-GS	

2.5.2. Main Features

General Operating Temp.	-25 C...+55C (All components meet req.)
IP Protection	IP54
	IP67 optional
ATEX Certificate	IEC 60079-0
	IEC 60079-11
	II2G Exic IIA T4 Gc
Pulse Reading	Magnetic
Magnetic Tamper Detection	Available (Triggers immediate shut-off valve upon detection of a magnetic field.)
Pulse Cable Tamper Detection	Available (Triggers immediate shut-off valve upon cable cut detection.)
Pulse Generator Tamper Detection	Optional (Activation upon LFTP removal and triggering immediate shut-off valve.)
GSM Operation	GPRS 4G / NB-IOT
FOTA (Remote Firmware Change)	Available
LCD Display	No LCD / Glass LCD / Graphic LCD
Multiband Antenna	Optional (Helical antenna standard. Electronic multiband antenna strongly recommended)
IrDA Interface	Optional (Additional and direct interface. No GSM connection required. Enables swift FW upgrade and parameter adjustments on-site.)
Battery Life	MB + SPC....10 years (1 comm. per day)
	MB only..... 6 years (1 comm. per day)
I/O	4 digital 2 analogue
Lid Open Protection	Available
Flash	Available (Supports enough data storage)
EEPROM	Optional (Supports high-capacity data storage if necessary)



	Subject: External Smart Meter Module	Page: 8/10
	Type: EM1805-J25-GS	

2.5.3. Operating Modes and Command Functions

The commands listed in the table below can be sent to the module either individually or in batches via software. They are denoted as “CMD”. Tags marked ‘RSP’ denote automatic responses generated by specific module data or alarm. The module transmits a string comprising a main segment along with a status tag.

Shut-Off	Type	Comments
Index	RSP	Current index as Liter at specific time stamp.
Read Log Index	RSP	Previous daily indexes as Liter at specific time stamp.
Clear Log	CMD	Clears log of the Module
Open / Close	CMD	Open or Close the gas flow via valve.
Init	CMD	Initializing the Module
DisInit	CMD	Disable Init. (Necessary during FOTA)
Operating Mode	CMD	SHUTOFF and PPM modes can be changed.
Sync Index	CMD	Equalize the mechanical and digital indexes
Wakeup Interval	CMD	Set the frequency of wake-up
Qmax	RSP	Qmax values at every hour
Unit	CMD	Unit shown as Liter, m3, kWh
Pulse	CMD	Pulse value as LMP (1 – 10 – 100 – 1000)
No-pulse Duration	CMD	Alert or shut-off after a specific hour without pulse.
LCD Counter	RSP	Number of LCD wake-up
FW version	RSP	Current firmware version
IP1-IP2	RSP	IP1: Normal IP2: Disaster. Automatic switching.
APN	CMD	Customer access point number. Firewall compatibility.
Decimal	CMD	Set decimal segment of index
Leakage Volume	CMD	Set leakage test volume
Leakage Duration	CMD	Set leakage test time
kFactor	CMD	Extra multiplication factor
Status	RSP	Lid Open Warning Limit Valve Position Credit Left Battery Level PCB Err LCD Counter GSM Err Cable Err Leakage Err No-pulse Err FOTA Err

Prepayment All features of “Shut Off” +	Type	Comments
Add Credit as Unit	CMD	Uploads credit as Liter
Add Credit as Money	CMD	Uploads credit as default Currency
Unit Price	CMD	Set unit price of gas. VAT included
Debt Limit	CMD	Additional consumption when credit is over
Warning Limit	CMD	Warning index before shut-off
Delete Credit	CMD	Credit deduction

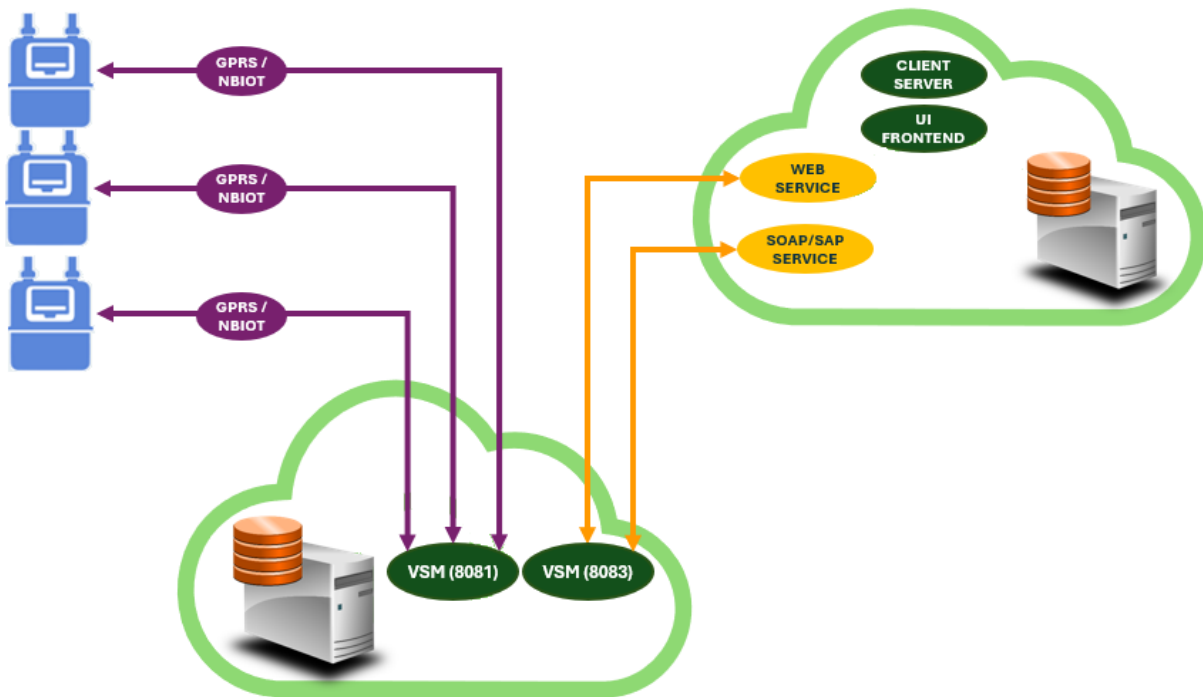
	Subject: External Smart Meter Module	Page: 9/10
	Type: EM1805-J25-GS	



3. Software

The communication between the EM1805 and the server is facilitated by the GPRS/NB-IoT infrastructure. The module supports 4G communication. Data read by the Module is transmitted to the server via the GPRS/NB-IoT module using the HTTP protocol.

System operations are managed by the VSM Web Service, which is a web service utilized for sending commands and retrieving information from the module, including index, errors, and status.

The data interchange format between the VSM Web Service and the Interface is JSON, offering a manufacturer-independent environment for the gas utility company.



	Subject: External Smart Meter Module	Page: 10/10
	Type: EM1805-J25-GS	

4. Order Notice

EM1805-J25-GS	Main Product Code
G / N	G: GPRS N: NBIOT
54 / 67	54: IP54 67: IP67
PGP0 / PGP1	PGP0 : with LFPT protection PGP1 : without LFPT protection
DP0 / DP1 / DP2	DP0: without LCD display DP1: with glass LCD display DP2: with graphic LCD display
AH / AE	AH: helical antenna AE: electronic antenna
IRO / IR1	IRO: without IrDA IR1: with IrDA
EPR0 / EPR1	EPR0: without eeprom EPR1: with eeprom
BTM / BTSPC	BTM: Main Battery BTSPC: Main Battery + SPC