

InduBox GSM IX

Industrial GSM / GPRS smart modem

Designed by Bausch Datacom!

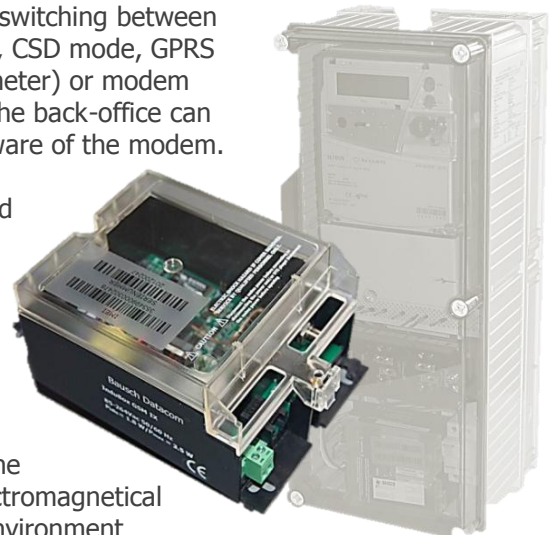
Making the grids smarter means that you also want to incorporate into the system the installed base of non IP enabled metering or logging devices adding wireless GPRS communication, TCP/IP protocol and functional intelligence by means of an external modem.

Therefore Bausch Datacom specializes in integrating applications, protocols and TCP/IP protocol stack in its modems. At the heart of the InduBox GSM IX modem, the SL6087 Sierra GPRS Wireless module supports a powerful software development environment - OpenAT -, which allows embedded ANSI C applications to be executed directly on the Wireless CPU. This means that Bausch Datacom can integrate tailor made applications or communication protocols on the customer's demand, a very powerful tool! Protocols such as IEC 60870-5-104, DLMS COSEM, Modbus or others can thus be implemented in the modem.

The standard InduBox GSM IX modem firmware in OpenAT supports modem grouping and mass deployment services, offered by the new 'Praxis' MMS (Bausch Modem Management System). Praxis provides for scheduled and grouped updating of modem firmware over the air - FOTA over FTP -, switching of modems in group from GSM data to GPRS or vice versa, based on information from the modems in the field about signal strength (rssi, bit error rate...), cost based and scheduled switching between different AMR metering scenario's (Socket Client or Server Mode, CSD mode, GPRS mode...), setting of a different baudrate (between modem and meter) or modem configuration (APN name,...). Even secure communication with the back-office can be set up by adding RSA encryption code to the embedded software of the modem.

Basically the modem firmware allows the modem to be connected by RS-232 and/or RS-485 to 2 or more non-IP enabled (electricity) meters and to communicate however by IP number and port number using GPRS. In this way a transparent communication with the host system can be maintained!

The InduBox GSM IX is especially conceived for 'heavy' industrial environments. The modem is tested and approved according to the TST 25-3 extended immunity requirements in the Belgian electricity market; e.g., when testing EN61000-4-3 - electromagnetical compatibility - Laborelec, the official Belgian lab creates a test environment generating 30 V/m field strengths instead of the standard CISPR24 field strength of 10 V/m.



Typical Applications

- Remote AMR communication
- Upgrade of non IP-enabled meters and loggers
- Vending machine monitoring
- Surveillance systems
- Point of Sales

Product Highlights

- Tested and approved according to extended immunity requirements
- Configurable watchdog reset or external reset by '+V' connection
- Universal integrated power supply 85-264 Vac (optional: 10-60 Vdc)
- Standard firmware allows Praxis modem grouping and mass deployment services and communication with meters without IP stack
- Optional firmware: IEC 60870-5-104, DLMS COSEM, Modbus...
- FOTA modem firmware upgrade over the Air
- AirVantage™ mass deployment services



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InduBox GSM IX hardware specifications

The InduBox GSM IX is a smart modem, built inside a Bausch Datacom wall-mountable housing with a Sierra Wireless GSM / GPRS CPU, external wide range AC power supply and configurable watchdog . The modem comes with logically separated RS-232 & RS-485 interfaces.

Housing

- Bausch IP51 InduBox bottom enclosure and sealable connector cover: ABS with self-extinguishing V0 additive
- Transparent sealable cover: polycarbonate with self-extinguishing V1 additive
- Overall dimensions with connector cover: 180 mm x 108 mm x 71 mm
- Overall dimensions without connector cover: 145 mm x 108mm x 71 mm

Connectors

- Mains: 2-pin plug and connector terminal block with screw contacts pitch 5.08 mm and maximum wiring section: 2.5 mm²
- RS-232, RS-485: female RJ-45 connectors
- AMP 50 Ohm FME antenna connector

Environmental

- - 40°C / + 85°C
- 10% - 75% (non condensing)

Power Supply

- 90-253 Vac / 47-63 Hz
- 6.3 VAidle 7.5 VAmix
- 3.5 Widle 4.5 Wmax
- Optional: 10-60 Vdc

Engine

- Built-in SL6087 800/900/1800/1900 MHz GSM/GPRS module / CPU: 32 bit, 104 MHz, ARM9, running Open AT®, TCP/IP stack – 'Class B'
- Magnetical dual band FME antenna included
- Integrated 3V SIM card reader
- Communication protocol: 2G GPRS Class 10 / CSD / SMS / TCP IP
- GSM data: asynchronous transparent mode
- Flow control (RTS/CTS – XON/XOFF) and speed buffering
- Automatic format and speed sensing (300 to 115.200 bps)
- AT command set support
- Circuit-switched 14.4 Kbps data and Group 3 FAX (Class 1 and 2)

Reset

- Long term configurable watchdog (1-68 h)
- Externally triggered reset ('+V' connection)

InduBox GSM IX Firmware

- Standard:
- Praxis Modem Management System: modem grouping and mass deployment
 - Communication w. meters without IP-stack
 - Socket Server & Client Mode...
 - 'GSM-GPRS' switching
 - FOTA (firmware over the Air)
 - AirVantage™ mass deployment services
- Optional :
- IEC 60870-5-104 / DNP 3.0 / DLMS COSEM / Modbus...
 - RSA encryption



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Configuration

- One complete RS-232 interface
- (TxD, RxD, DCD, DTR, RTS, CTS, RI and GND)
- RJ-45 connector, connected to UART1

DTE interfaces

- 3-wire RS-232 (RXD, TxD, GND & '+V')
Galvanically separated
Connected to UART1 of the GPRS module
- 3-wire RS-485 (A, B, GND & '+V')
Galvanically separated
Connected to UART2 of the GPRS module

Approvals

- CE + TST 25-3 extended immunity
- EN61000-3-2 Electromagnetic compatibility, part 3, section 2
Limits for harmonic current emissions.
- EN61000-3-3 Electromagnetic compatibility, part 3, section 3
Limitations of voltage fluctuation and flicker.
- EN61000-4-2 Electromagnetic compatibility, part 4, section 2
Electrostatic discharge immunity test.
CISPR24: 4 KV contact / 8 KV air
TST25-3: 8 KV contact (20 +/- contacts) / 15 KV air (20 +/- discharges)
- EN61000-4-3 Electromagnetic compatibility, part 4, section 3
Radiated fields immunity test.
CISPR24: 10 V/m 80 MHz - 2000 Mhz, mod. AM 80% 1KHz
TST25-3: 30 V/m 80 MHz - 2000 Mhz, mod. AM 80% 1KHz
- ENV50204 Electromagnetic compatibility, Basic immunity standard, Radiated
Electromagnetic field from digital radio telephones immunity test.
CISPR24: 10 V/m 890-2400 MHz, 1% freq step, 1s dwell, 50% duty,
200 Hz repetition time
TST25-3: 30 V/m 890-2400 MHz, 1% freq step, 1s dwell, 50% duty,
200 Hz repetition time
- EN61000-4-4 Electromagnetic compatibility, part 4, section 4
Electrical fast transient/burst immunity test.
CISPR24: 0.5 KV and 1 KV 5/50 ns, 5 Khz rep. freq on AC mains
TST25-3 : 2 KV and 4 KV, 5/50 ns, 5 Khz rep freq on AC mains
- EN61000-4-5 Electromagnetic compatibility, part 4, section 5
Surge immunity test.
CISPR24: 10 pulses 1 KV 1,2/50 µs (5+ 5-) on AC mains
TST25-3: 6 KV pulses
- EN61000-4-6 Electromagnetic compatibility, part 4, section 6
Conducted immunity test.
CISPR24: 3 V 0.15 MHz - 80 MHz, mod. 80% at 1 Khz on mains
TST25-3: 10 V 0.15 MHz - 80 MHz, mod. 80% at 1 Khz on mains
Magnetic fields applied to all accessible surfaces
1000 At (ampere turns) – 1A on 1000 turns
- EN61000-4-8 Electromagnetic compatibility, part 4, section 8
Power frequency magnetic field immunity test.
CISPR24 levels
- EN61000-4-11 Electromagnetic compatibility, part 4, section 11
Voltage dips, short interruptions and voltage variations immunity test.
CISPR24 levels
- EN61000-4-18 Oscillatory waves
1 MHz 2,5 KV, rep rate 400 Hz applied on mains in common mode
100 Khz 2,5 KV, rep rate 40Hz applied on mains in common mode
1 MHz 1KV, rep. Rate 400 Hz applied on mains in differential mode
100 MHz 1KV, rep. Rate 40 Hz applied on mains in differential mode
- EN55022 Limits and methods of measurement of radiodisturbance characteristics of ITE-equipment.
EN55022 class B limits (AV - QP)
Radiated emission : 30 - 1000 MHz
Conducted emission (CISPR16) : 0.15 - 30 MHz
- EN55024 Performance criteria for immunity tests
- EN61000-6-3 Performance criteria for emission tests

