

On-board equipment for static m2m applications :

- ▶ Embedded / remote communicating device,
 - ▶ Integrated equipment / optimized mechanical size,
 - ▶ Open development framework based on Linux OS.
- TCP/IP connectivity over: GPRS, Ethernet, WLAN (option),
 - Specific connectivity: CAN bus, RS232, RS485, Audio, I2C, GPIO,
 - GSM Voice call, SMS,
 - Fast installation,
 - Tough design.

1. HARDWARE KEY FEATURES

SYSTEM/CPU

- ARM920T microcontroller
- Up to 200 MIPS at 180MHz
- Real Time Clock saved by coin Lithium battery
- Embedded temperature control

SDRAM MEMORY

- 32 Mbytes
- 10 Mbytes used for system
- *Option 128 Mbytes*

FLASH MEMORY

- 32 Mbytes
- 12 Mbytes used for system
- *Option 64 Mbytes*

WWAN

- Wireless GSM/DCS GPRS module designed for m2m applications
- E-GSM900/1800 MHz according to ETSI GSM Phase 2+ standard
- GPRS class B class10
- IMEI inside

ETHERNET

- IEEE 802.3 10/100baseT compliant

BUS/PROTOCOLES

- CAN 2.0A or 2.0B, high speed CAN transceiver (*Low Speed CAN option*)
- ModBus protocol (over IP, serial)

MISCELLANEOUS

- High density SUBD15 interface connector : serial (RS232 or RS485), GPIO, I2C, audio
- Standby mode mechanisms: OFF mode (5µA at 12V, 20µA at 24V, 50µA at 48V), sleep mode (8,5mA at 12V, 4,5mA at 24V, 2,8mA at 48V)
- Multi wake up modes from sleep mode (Real Time Clock, incoming GSM call, CAN bus activity, external VDC input event)

OPTIONS

- *Backup battery (30 minutes min.)*
- *WLAN 2.4 GHz, IEEE 802.11g compliant*
- *Integrated customer specific applications and protocols (specific hardware internal options)*

ENVIRONMENTAL

- Operating: - 20°C to +55°C
- Operating with wireless communication limitations: - 30°C to +80°C
- Storage: -40°C to +85°C
- Humidity: 95% , non condensing

CERTIFICATIONS

- EMC: Radio and Telecommunication Terminal Equipment approved (R&TTE directive)

kerlink

wirma® telemetry

M2M ON-BOARD UNIT PRODUCT BRIEF



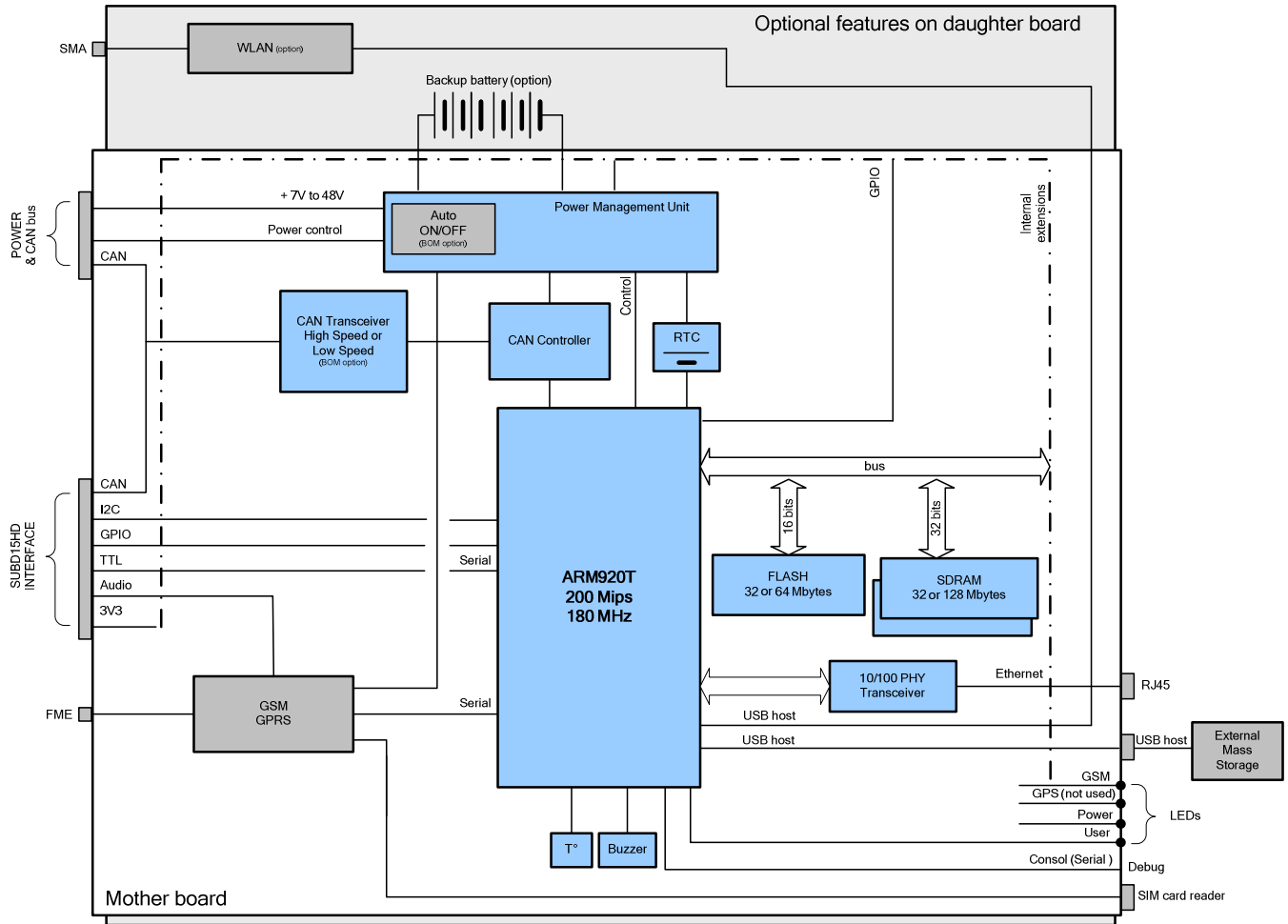
LINUX EMBEDDED
OPERATING SYSTEM

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2. HARDWARE BLOCK DIAGRAM



3. PHYSICAL CHARACTERISTICS AND INTERFACES CONNECTORS



Front Panel

Indicators: 4 LEDs

- GSM network status (permanent LED ON : not registered on GSM/GPRS network / Flashing slowly: registered on a network / Flashing rapidly: connected.)
- GPS timepulse (not used on wirma telemetry)
- Power ON status
- User reserved

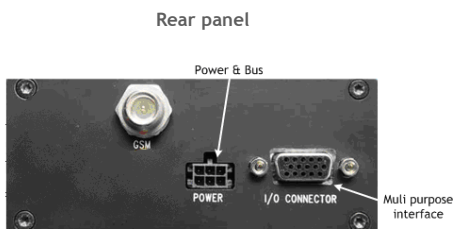
Ethernet interface: standard RJ45 connector Ethernet access compatible 10/100 Base-T

USB interface: standard host USB 2.0 high power (500mA), full speed (12Mbits/s)

SIM card reader: extractible socket

Debug facility trough specific front panel: card edge connector for debug (only on wirma telemetry debug kit)

Aluminium ruggedized enclosure (case profile black)
Dimensions: 105mm x 44mm x 120mm / weight: 420g



Rear Panel

Power & BUS connector: 6 points Micro-Fit

- Power supply: 7-48V direct, 130mA typical at 12V
- Power control: after contact detection or automatic ON/OFF (option)
- Bus: CAN BUS (2 wires)

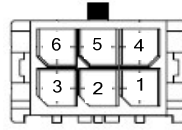
Multi-purpose standard interface: high density SUBD15

- I/O, serial, I2C, CAN, Audio

RF connectors:

- FME male for GSM/GPRS antenna
- SMA female for WLAN antenna (option)

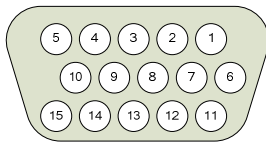
Power & BUS connector pin assignment:



6 points Micro-Fit on rear panel

Pin	Signal	Description
1	CANH	Can bus
2	GND	0V
3	APC	After contact
4	CANL	Can bus
5	GND	0V
6	V+ Battery	7V: Min 12V: Typ 48V: Max

Multi-purpose standard interface connector pin assignment:



High density SUBD15 on rear panel (SUBD9 form factor)

Pin	Signal	Description	Multiplexed I/O	Level
1	3V3 OUT	Max 100 mA		
2	UART-IN	Serial RX	PA18 GPIO	Digital: 0-3V3
3	PA21	GPIO		Digital: 0-3V3
4	Speaker +	GSM audio OUT P		Analog
5	Speaker -	GSM audio OUT N		Analog
6	CANH	CAN bus HIGH		
7	UART-OUT	Serial TX	PA17 GPIO	Digital: 0-3V3
8	SCL	I2C: SCL		Digital: 0-3V3
9	PD15	GPIO		Digital: 0-3V3
10	Microphone +	GSM audio IN P		Analog
11	CANL	CAN bus LOW		
12	SDA	I2C: SDA		Digital: 0-3V3
13	PA20	GPIO		Digital: 0-3V3
14	Microphone -	GSM audio IN N		Analog
15	GND	0V		

4. SOFTWARE KEY FEATURES

Operating system

Standard Linux OS v2.6.13
File system JFFS2
Standard Linux interfaces with Kerlink added API
Java Virtual Machine and OSGI support

Specific drivers interface

- Specific drivers:
- Wireless connectivity (option WLAN)
 - Specific IO (ADC, DAC, GPIO, ...)
 - Specific buses (UART, I2C, CAN, ...)
 - Modbus over TCP/IP or serial link

Standard interfaces:

- POSIX1 file system on flash memory (up to 20 MB user space available for 32 Mb Flash)
- TCP/IP BSD4.4 socket, based on GPRS, Ethernet or WLAN network interfaces
- Can4Linux v0.7

**KMS interface :
KerLink M2M Services**

Simple and reduced interfaces using XML format over TCP/IP socket providing complex services, based on event/action programming:

- Input (analog or digital) Threshold alarm
 - CAN frame monitoring
 - Mobile GSM call and SMS management
 - Remote application data exchange with optional on the fly 128bits AES encryption
 - System alarm
 - Internal statistic delivery
 - Automatic or manual bearer selection
- M2M services can be added on demand.*

Software Development Kit

- Provided to develop local application, including:
- Linux cross compiler/link based on GnuTools 3.4.4 for Arm under Windows (Cygwin) or X86 toolbox
 - Software agent to manage wirma remote connection, software download and log upload (Windows/Linux)
 - Windows based application to describe on event/action description
 - User manual and KerLink M2M Services interfaces specifications

Over The Air tools

- Remote debug trace activation and upload
- Remote application
- System update





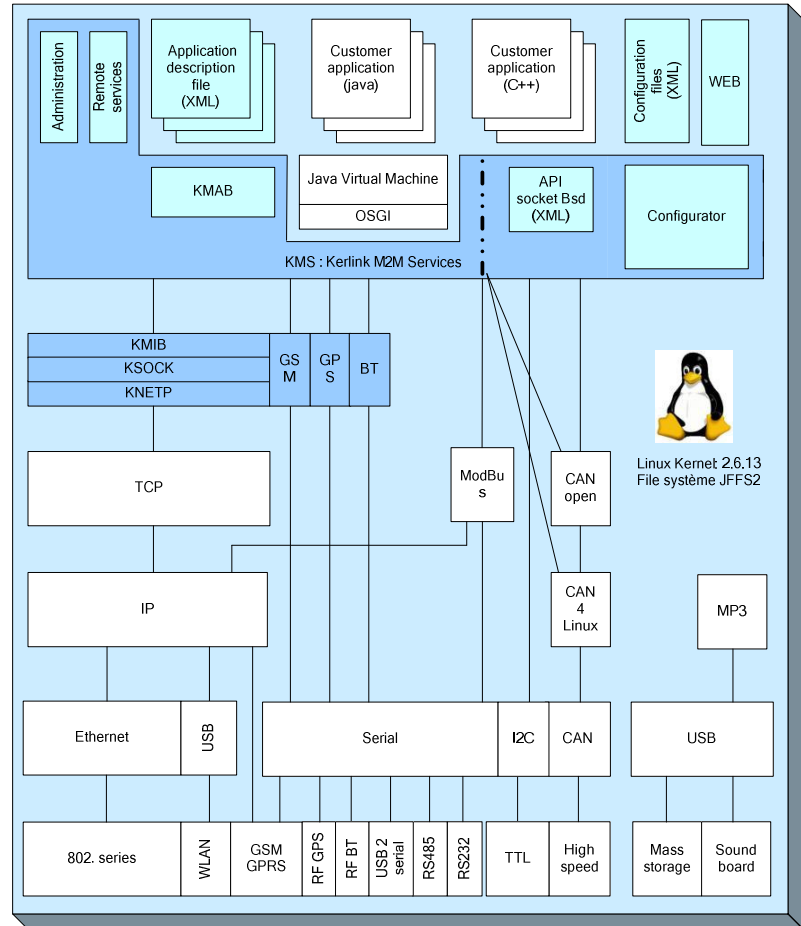
5. SOFTWARE ARCHITECTURE

KMAB: event/action configurable monitor

KMIB: specific format for M2M data collection

KSOCK: socket like interface enabling applications connection to wanasy network

KNETP: M2M mobility network protocol



6. DEVELOPMENT TOOLS

Software Development Kit (SDK): GNU tools for compiling and linking of an embedded application, interface specification with m2m basics functions, debug facility. Allows quicker and easiest development of a specific solution under Java, C or C++.

Starter kit: WIRMA Telemetry unit (included WLAN option) with dedicated and assembled front cover for debug facility, extension demo board (with GPIOs, relays...), 220V power supply, magnetic GSM/GPRS antenna, WLAN plug antenna, USB cable, on site training day, support, software development kit.

Telemetry Debug Kit: WIRMA Telemetry unit with dedicated and assembled front cover for debug facility, debug probe, 220V dedicated power adaptor, magnetic GSM/GPRS antenna, USB cable, on site training day, support, software development kit.

Debug probe kit: debug probe with dedicated and assembled front cover for debug facility, software development kit.

7. OPTIONNAL ACCESSORIES

220V/12VDC dedicated power adaptor

RS232C adaptor (SUBD9 connector termination)

RS485 adaptor (SUBD9 connector termination)

GSM antennas allowing integration in both internal (magnetic type) and external environments (waterproof magnetic type).

WLAN antenna allowing integration in both internal (magnetic type, plug type) and external environments (waterproof magnetic type).

Full range of antennas and cables for telemetry equipments available on demand.

8. PACKAGE CONTENTS

Delivered as assembled set, including :

- Mounting material (metallic fixing straps)
- Power supply cable (power + CAN bus wires, 3 meters, can be easily shortened for customer particular integration)
- Quick installation guide (contents, power cable connection tutorial)