EMB-GATE920T

Datasheet

Document information

Versions & Revisions

Revision	Date	Author	Comments
1.0	19/02/2013	F. Montorsi	First version
1.1	12/03/2013	F. Montorsi	Added HW connector description; revised naming scheme for better readability
1.2	01/05/2013	F. Montorsi	Added mechanical overview and some electrical data
1.3	11/06/2013	F. Montorsi	Document EMB-GATE920T-CB details

References

Ref	Version	Author	Title
1	Rev. 1.3	Embit	EMB-GATE920T Operating System Overview
2	Rev. 1.3	Embit	EMB-GATE920T SDK Quick Start Guide
3	Rev. 1.0	Embit	EMB-GATE920T Software Uploading Guide
4	Rev 1.0	Embit	EMB-GATE920T DataCollector™ Guide

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1 Description

EMB-GATE920T is the Embit gateway solution. EMB-GATE920T interfaces Embit radio devices (802.15.4, ZigBee, WMBus, etc.) to standard wired & wireless networks, such as TCP/IP (802.3 Ethernet), GPRS/HSDPA, Wi-fi 802.11 networks. The EMB-GATE920T is a standalone computer in a compact form factor and with reduced power consumption, highly suited for industrial applications.

EMB-GATE920T enables Embit wireless networks to send and receive data & commands to/from Internet, local area networks, etc. Radio connectivity toward Embit wireless networks is provided by 1 or 2 Embit radio module(s) soldered on-board and communicating with the EMB-GATE920T CPU by means of fast UART interface(s) (operating at data rates up to 115200 bps).

EMB-GATE920T can be configured to act as a standalone Embit radio network coordinator, gathering data from the Embit wireless sensork network (WSN) and receiving/sending commands from/to remote devices. Additionally, it can be easily attached to an LCD and it may run graphical applications to present to the end user a friendly man-machine interface (the LCD-enabled version is the EMB-GATE920T/3.5/* or EMB-GATE920T/7.0/* variants of the EMB-GATE920T).

Given that the **EMB-GATE920T** is an embedded Linux-based system, it can be easily loaded with custom applications to implement additional functionalities; for this purpose Embit provides in the EMB-GATE920T SDK a virtual machine pre-configured to easily cross-compile C/C++ custom software for the EMB-GATE920T hardware architecture. To enable even faster application deployment, scripting languages like Python and PHP are supported.

Besides the 2 built-in Embit modules, the **EMB-GATE920T** can communicate with other devices through several interfaces: Ethernet, USB, RS232, SPI, I2C, SDHC memory cards. In its EMB-GATE920T/*/HSDPA and EMB-GATE920T/*/WIFI variants, HSDPA or Wi-Fi 802.11 wireless connectivity is provided by USB dongles.

1.1 Specifications

- 32 bit ARM920T CPU at 400MHz / 533MHz
- 64MB SDRAM, with 128MB or 1GB of (non-volatile) NAND FLASH memory
- Embit wireless connectivity: 802.15.4, ZigBee or WMBus
  (any two Embit modules can be attached to the EMB-GATE920T at the same time)
- Standard connectivity: TCP/IP, Wi-fi 802.11 or GPRS/HSDPA
- Display options: none, 3.5" or 7" touch screens
- Local interfaces: Ethernet, USB, RS232, SPI, I2C, SDHC memory card
- Real-time clock (RTC) with backup lithium cell battery
- Power supply: 300mA-1000mA @ 5V

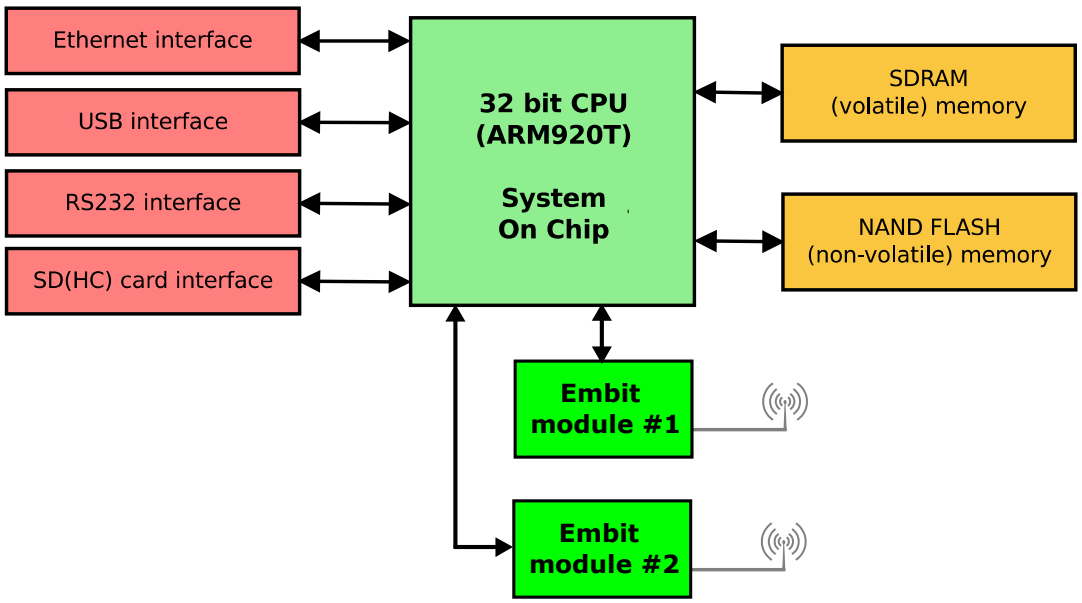
1.2 Applications

- Smart meter
- Smart grid concentrator
- Data logging
- Proprietary solutions

1.3 Block Diagram

In Fig. 1 a simple block diagram illustrating the architecture of the EMB-GATE920T is shown. The CPU is connected to several hardware interfaces, to volatile and non-volatile memories and to two Embit wireless module (that enable wireless Embit connectivity).

Figure 1: block diagram for the EMB-GATE920T



1.4 Software Overview

The EMB-GATE920T is provided either as an open platform with Embit software development kit (SDK version) or as standalone “black box” system, with pre-loaded Embit software (LIGHT version).

In the SDK version, the EMB-GATE920T is provided with a large software support package. The system runs an operating system Linux-based and comes pre-loaded with many libraries and tools to ease the development of gateway systems and gateway interfaces (e.g., web servers, graphical user interfaces, scripting languages, etc). For more information about the OS, please refer to [1]. To develop your own custom software and upload it to the EMB-GATE920T, a step-by-step guide is available, together with a virtual machine (see [2] and [3]).

In the LIGHT version, the EMB-GATE920T comes with the Embit DataCollector software suite, which transform the EMB-GATE920T in a web server (for friendly user interfacing) or in a machine-friendly server (which allows to configure Embit radio network via binary commands). For more information, please refer to [4].

1.5 Hardware Overview

In Fig. 2 a photo of the EMB-GATE920T main board is shown, with annotations for each interface available to the customer. Note that non-annotated interfaces/connectors are reserved for internal use and for debugging purposes only.

Figure 2: available hardware interfaces/connectors on the EMB-GATE920T

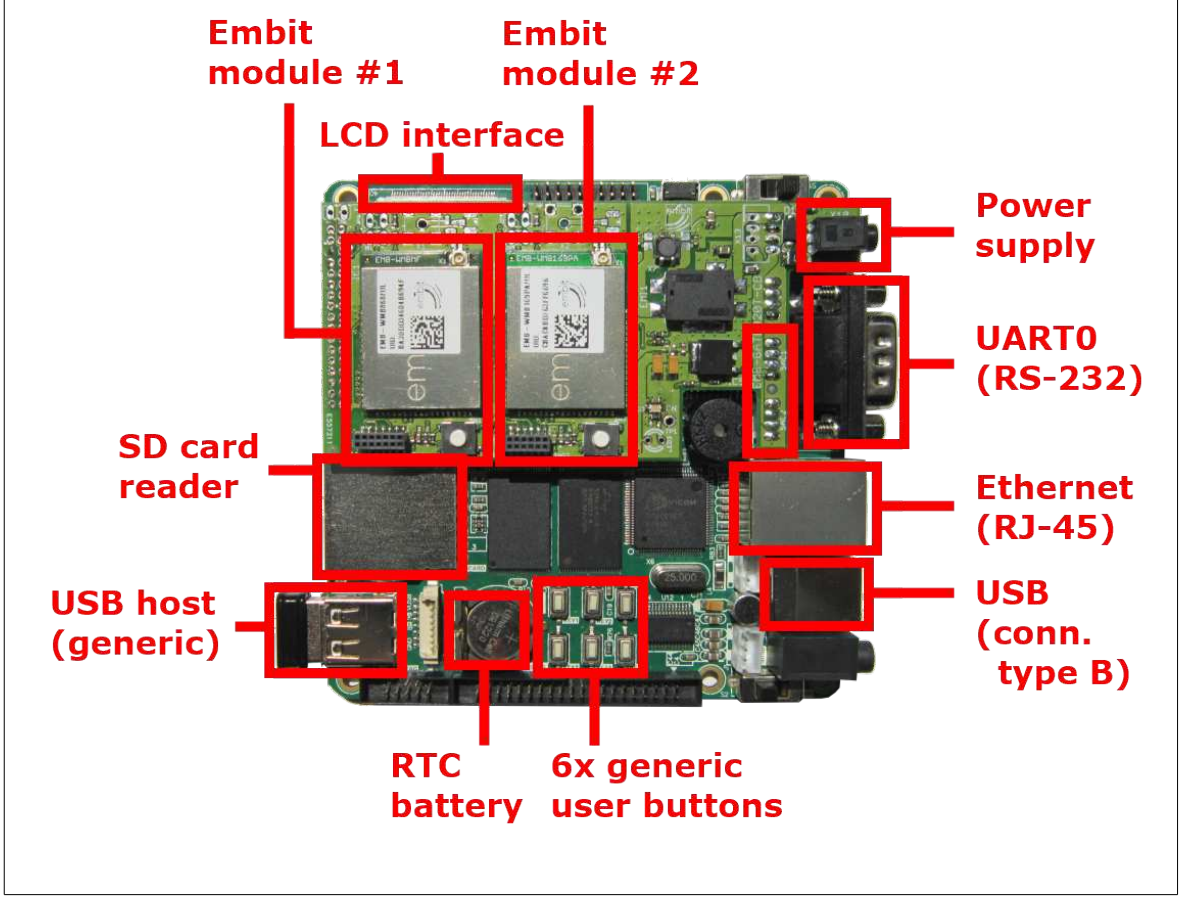


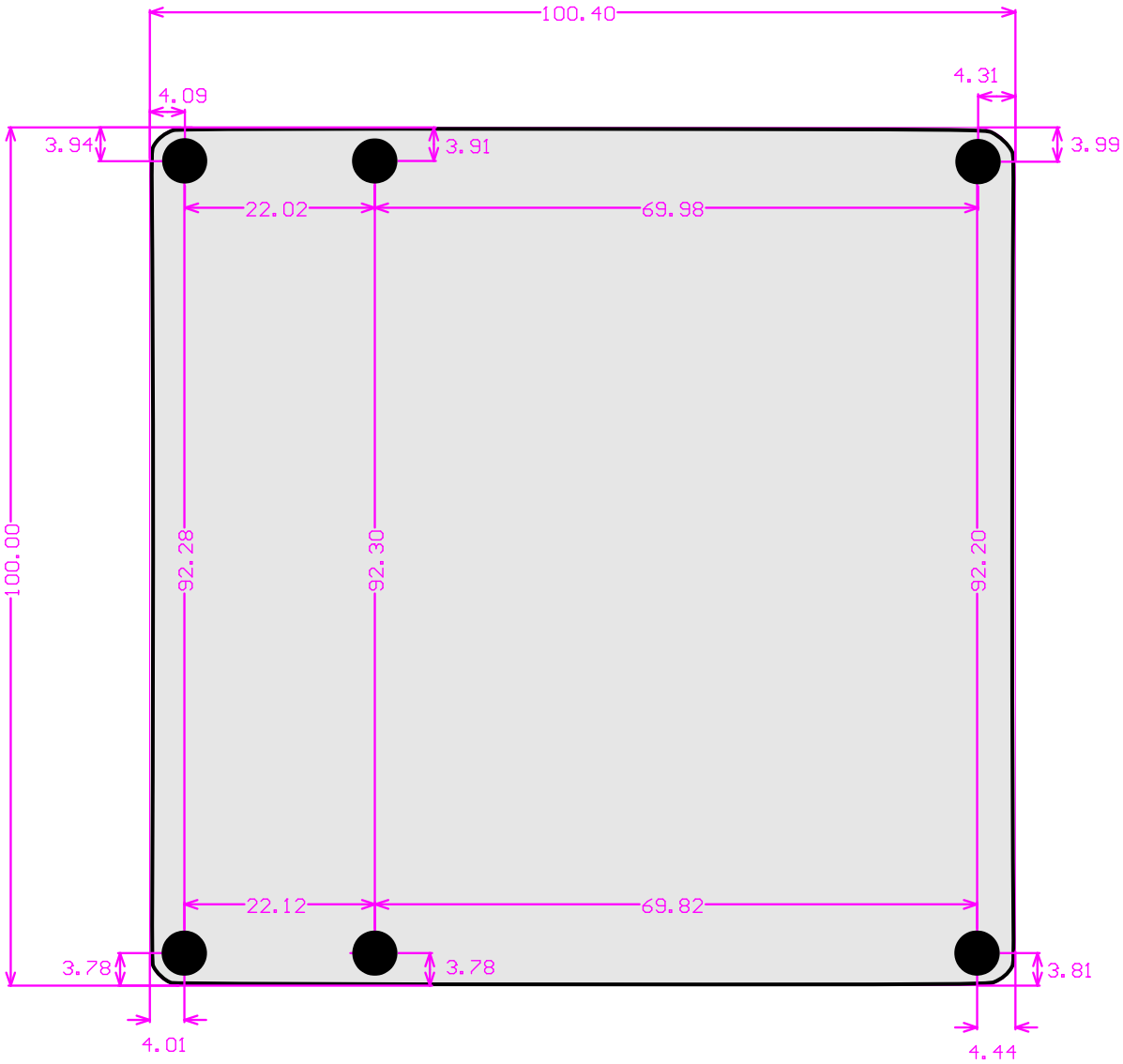
Fig. 2 shows the EMB-GATE920T carrying 2 Embit modules and an 802.11 Wi-Fi adapter, but the actual devices provided with the EMB-GATE920T depend on the chosen configuration (e.g., the 802.11 Wi-Fi adapter is optional, the Embit module #2 is optional, etc). Indeed the platform is highly flexible and can be attached to a number of USB/Ethernet/RS-232 devices. Moreover the memory of the system can be easily expanded using the SD card reader interface.

Please refer to Section 3, Ordering Information, for more details on the available EMB-GATE920T configurations. Custom configurations are available on request.

1.6 Mechanical Overview

In Fig. 3 the size of the EMB-GATE920T main PCB are reported; the positions of the 6 holes available for mounting the PCB in custom enclosures are highlighted.

Figure 3: Mechanical details about the EMB-GATE920T mainboard (all dimension units are in millimeters)



2 Electrical characteristics

2.1 Absolute Maximum Ratings

	Value	Unit
Power Supply Voltage	+5	Vdc
Storage Temp. Range	0 ~ +70	°C

2.2 Operating Conditions

Parameter	Min	Max	Unit
Power Supply Voltage*	4.75	5.25	Vdc
Operating Temperature Range	0	70	°C

2.3 Power Consumption

Variants	Min. value*	Max value**	Unit
EMB-GATE920T/NA/*	~300	~380	mA
EMB-GATE920T/3.5/*	~600	~680	mA
EMB-GATE920T/7.0/*	~900	~1000	mA

* = with CPU loaded <1%, power supply @ 5.0V

** = with CPU loaded >99%, power supply @ 5.0V

2.4 RF Characteristics

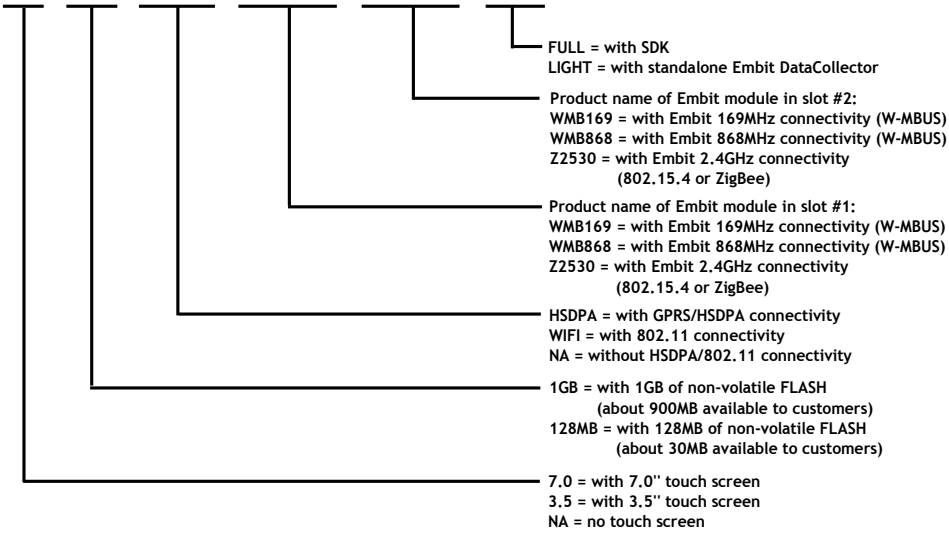
The RF characteristics of the Embit radio modules connected to the EMB-GATE920T (through the PCB marked as “EMB-GATE920T-CB” or via USB) are documented in the datasheets of the Embit radio modules.

3 Ordering informations

3.1 Part Number

Product variations:

EMB-GATE920T / 7.0 / 1GB / HSDPA / WMB169 / WMB868 / FULL



Example:

EMB-GATE920T/NA/128MB/NA/Z2530/WMB169/FULL denotes an EMB-GATE920T configured with 128MB of non-volatile FLASH memory, with connectivity for both 802.15.4/ZigBee 2.4GHz and WMBUS 169MHz networks and packaged together with the EMB-GATE920T SDK to allow customers develop their own software to upload and use on the EMB-GATE920T (no touch screen and no HSDPA/802.11 connectivity).

4 Disclaimer

The user must read carefully all the documentation available before using the product. In particular, care must be taken in order to comply with the regulations (i.e. power limits, duty cycle limits, etc.).

4.1 Handling precautions

This product is an ESD sensitive device. Handling precautions should be carefully observed.

4.2 Limitations

Every operation involving a modification on the internal components of the module will void the warranty.

4.3 Disclaimer of liability

The information provided in this and other documents associated to the product might contain technical inaccuracies as well as typing errors. Regulations might also vary in time. Updates to these documents are performed periodically and the information provided in these manuals might change without notice. The user is required to ensure that the documentation is updated and the information contained is valid. Embit reserves the right to change any of the technical/functional specifications as well as to discontinue manufacture or support of any of its products without any written announcement.

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