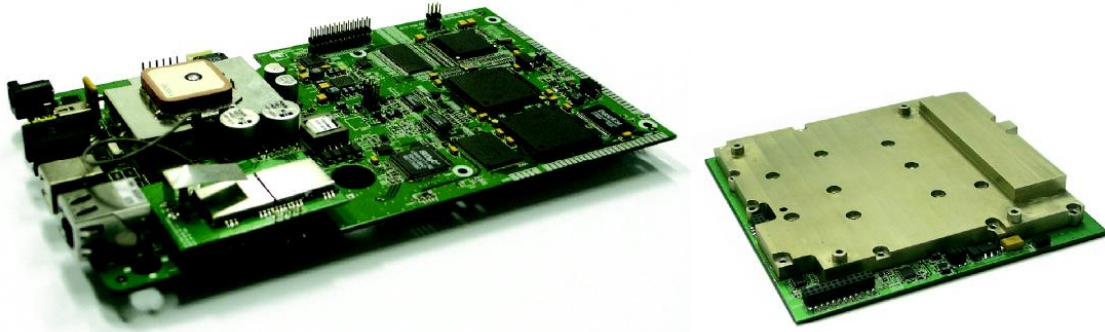


# DATASHEET

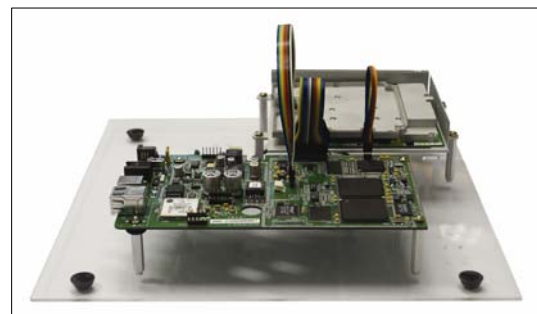
## BGAN CORE MODULE



- Compact Design
- Supports Inmarsat Class 3 BGAN services for up to 384 kbps downstream , 240 kbps upstream and symmetric streaming data at 32 and 64Kbps
- Supports circuit-switched voice on PSTN interface with Calling Line Identification Detection (CLIP, type-1)
- Supports packet-switched data via Ethernet interface with DHCP and NAT enabled
- Supports Short Message Services (SMS)
- On-board GPS receiver and SIM card holder
- Built-in antenna connectors for external antennas (Inmarsat BGAN and GPS)
- Fully compatible with the Inmarsat LaunchPad application software
- Integrated with an embedded HTTP server supporting link set up and configuration via a customizable web interface

#### Optional hardware:

- Man Machine Interface (MMI) consists of an LCD and 4-button keypad. Supports customizable MMI features
- Class 1 Bluetooth Module. Supports application profiles: Headset Profile (HSP) (Audio Gateway), Cordless Telephony Profile(CTP) (Gateway), Serial Port Profile (SPP)



### CM DEVELOPMENT KIT

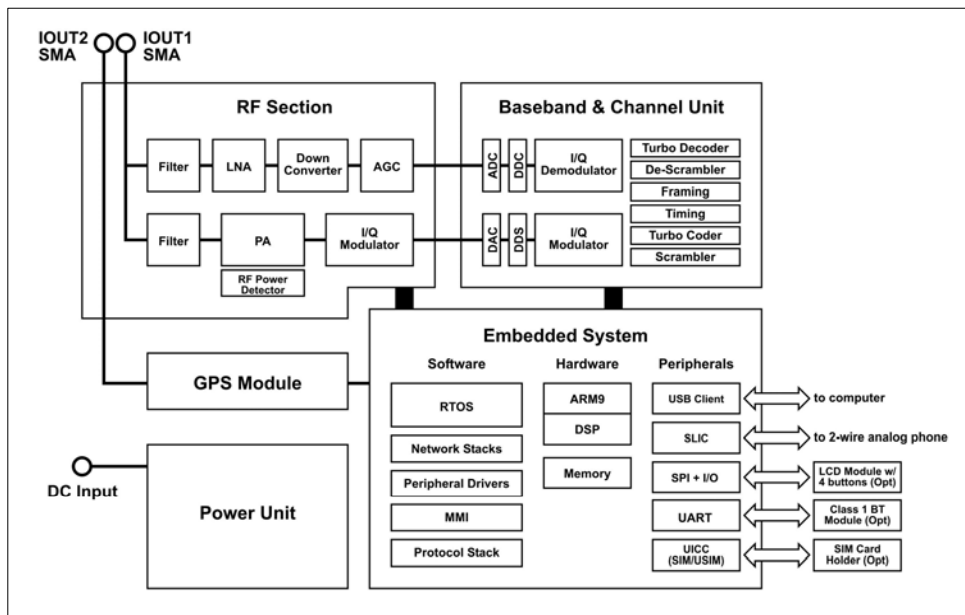
Addvalue offers a BGAN Development Kit to speed up the development cycle.

The Kit consists of an RF board, baseband board, GPS processing module, MMI hardware (LCD and keypad), SIM-card holder and RS232 cable.

The Kit contains the following in a CD-ROM:

- 1) source code for MMI development,
- 2) source code for customizing the web interface of the embedded HTTP server,
- 3) AT Command Interface document,
- 4) Firmware Upgrade Utility, and
- 5) sample user guide.

## BLOCK DIAGRAM



## HARDWARE SPECIFICATIONS

### System

Processor	: ARM9 Core, DSP TI C55XX
Modulator/Demodulator	: Proprietary ASIC/FPGA based
Flash ROM	: 16Mbytes
SDRAM	: 32Mbytes
EEPROM	: 16Kbits

### Radio

Frequency	Receive	: 1525.0MHz – 1559.0MHz
	Transmit	: 1626.5MHz – 1660.5MHz
Channel Modulation	Receive	: QPSK and 16QAM
	Transmit	: $\pi/4$ QPSK
Antenna	Type	: External
	Connector	: SMA
Max. Bearer Data Rate	Receive	: 384 kbps
	Transmit	: 240 kbps
GPS	Band	: 1575.42 $\pm$ 1 MHz (min.)
	Antenna Connector	: SMA

### 1.1 Interfaces

Man Machine Interface (MMI)	Protocol	: STD I/O
	Connector	: FPC Horizontal
Voice	Standard	: 600 $\Omega$ CCITT Rec 473
	Connector	: RJ11
Ethernet	Standard	: IEEE 802.3 10Base-T
	Data Rate	: 10 Mbps
	MAC	: RJ45
	Cable Length	: 100 meters / 328 feet on Cat.5 cable (max.)

### 1.2 Power

Power Input	Operating	: 10 – 28 V <sub>DC</sub>
	Charging	: 15 – 28 V <sub>DC</sub>
	Current	: 2.8 A (max.)
Power Consumption	Standby	: 2 Watts

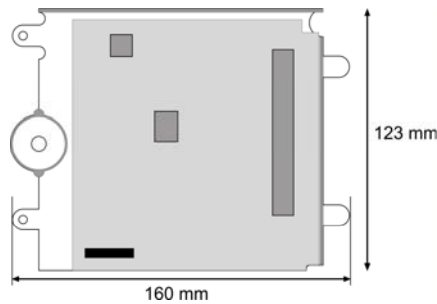
Charging Circuitry	Operating	: 22 Watts
	Operating+Charging	: 42 Watts
	Supported Battery	: Lithium ion Nominal: 10.8V <sub>DC</sub> Range: 10.5 – 12.6 V <sub>DC</sub>

**Environmental**

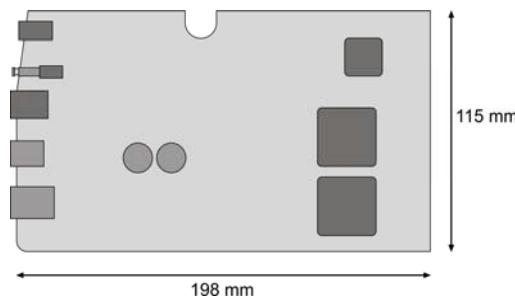
Operating Temperature	: -20°C to +60°C : -4°F to +140°F
Ambient Storage Temperature	: -40°C to +80°C : -40°F to +176°F

**Dimensions**

RF Board  
160mm x 123mm



Baseband Board  
198mm x 115mm



**Optional Items**

Class 1 Bluetooth Module	Standard	: Bluetooth Specification 1.1
	Chipset	: CSR
	Frequency Band	: 2.4GHz ISM Band
	Data Rate	: 1Mbps
	RF Range	: 100 meters / 328 feet (outdoor)
	Supported Profiles	: Generic Access Profile, Service Discovery Application Profile, Serial Port Profile, Headset Profile (Audio Gateway), Cordless Telephony Profile (Gateway)
Class 1 Bluetooth CTP Handset	Standard	: Bluetooth Specification 1.2
	Chipset	: RFMD (SiW)
	Frequency Band	: 2.4GHz ISM Band
	Supported Profile	: Cordless Telephony Profile Serial Port Profile
	Configuration	: Module or Handset configuration mode (NOTE: the CTP handset supports full configuration on BGAN core module via its own LCD)
UT MMI (Keypad and LCD)	Interface	: SPI + Standard I/O 4-button keypad and 132x54 pixels monochrome LCD
Antenna (Customized)	Type	: Patch Antenna, external
	Gain	: 8.5dBic
GPS antenna	Type	: Active type antenna operating at 3.3v dc
	Gain	: Gain of about 24dB with active LNA
Battery Pack (Customized)	Type	: Lithium ion
	Capacity	: [Built to Specification]

## SOFTWARE SPECIFICATIONS

### 1. Real Time Operating System (OS)

The BGAN Core Module operates on VxWorks Version 5.5.1

### 2. UT MMI Software Module

The UT MMI software module supports an interface to an LCD with 4 navigation buttons. This is an option to support an integrated hardware Man Machine Interface (MMI) on the application. The functions supported on this module are listed below.

Category	Function	Description
Link Setup	GPS	<ul style="list-style-type: none"> <li>▪ Shows new/stored GPS being used</li> <li>▪ Allows use of last-stored GPS location</li> <li>▪ Advises optimum orientation and elevation angle upon approved GPS location</li> </ul>
	Network Acquisition	<ul style="list-style-type: none"> <li>▪ Displays signal strength while the user adjusts the pointing direction of the antenna</li> <li>▪ Displays the Service Provider information upon successful network acquisition</li> </ul>
Circuit Switched	Emergency Call	<ul style="list-style-type: none"> <li>▪ Allows the user to make emergency call even when there is no SIM card inserted, SIM does not have value or is barred</li> </ul>
	Making Phone Calls	<ul style="list-style-type: none"> <li>▪ Allows the user to dial to a number stored in the UT phonebook or USIM phonebook</li> </ul>
	Viewing Call History	<ul style="list-style-type: none"> <li>▪ View missed call, received call and outgoing call</li> <li>▪ Perform dialling from the call history list</li> <li>▪ Clear the call history</li> </ul>
Settings	Security	<ul style="list-style-type: none"> <li>▪ Perform PIN Lock on the SIM card (USIM PIN and USIM PIN2) and the User Terminal</li> </ul>
	Network	<ul style="list-style-type: none"> <li>▪ Defines profile for different APN</li> <li>▪ Defines how the PS service is being attached</li> </ul>
	Ethernet/LAN Interface	<ul style="list-style-type: none"> <li>▪ Defines the DNS settings</li> <li>▪ Configures local IP addressing</li> <li>▪ Configures the DHCP server (IP range and leased time)</li> <li>▪ Displays current configuration status</li> <li>▪ Select Operational Mode (Bridge Mode, Router Mode – Single User and Router Mode – Multi User)</li> </ul>
	Bluetooth Interface (OPTIONAL)	<ul style="list-style-type: none"> <li>▪ Enables/Disables Bluetooth AP</li> <li>▪ Enables/Disables “discoverable”</li> <li>▪ Searching and pairing with other Bluetooth devices</li> <li>▪ Lists paired devices and perform actions on the paired devices</li> </ul>
	Telephony	<ul style="list-style-type: none"> <li>▪ Configures the Caller ID standard supported by the external 2-wire phone</li> </ul>
	Others	<ul style="list-style-type: none"> <li>▪ Turns the UT MMI On/Off and adjusts the contrast/brightness of the LCD display</li> <li>▪ Configures the tone and volume for keypad, warning, ringing and SMS alert. The user may also turn the sound On/Off</li> </ul>
In-Call Menu	Voice Call	<ul style="list-style-type: none"> <li>▪ End call</li> </ul>

### 3. Embedded HTTP Server

The BGAN core module software comes with an embedded HTTP daemon and APIs, supporting a user-friendly web-based configuration interface (Web Console) over Ethernet with full functions, as listed below:

Category	Function	Description
Link Setup	GPS	<ul style="list-style-type: none"> <li>Obtains a new GPS fix</li> <li>Allows the user to use last-stored GPS position</li> </ul>
	Network Acquisition	<ul style="list-style-type: none"> <li>Advises the user on the antenna pointing direction and the elevating angle</li> <li>Displays signal strength to facilitate the antenna pointing</li> </ul>
Telephony	Call History	<ul style="list-style-type: none"> <li>Displays the missed call, received call and outgoing call and their respective time</li> </ul>
	Quick Dial	<ul style="list-style-type: none"> <li>Displays a graphical handset on the screen for quick dialling. The user may directly enter the number by pressing the respective buttons.</li> </ul>
	Phonebook	<ul style="list-style-type: none"> <li>Supports 2 phonebooks, the terminal phonebook and the SIM phonebook</li> </ul>
	Emergency Call	<ul style="list-style-type: none"> <li>Support emergency call even when there is no SIM card inserted, SIM is out of value or is barred</li> </ul>
Data	Primary Profiles	<ul style="list-style-type: none"> <li>Supports up to 11 connection profiles.</li> <li>For each profile, the user may define the Remote IP address (static or obtain dynamically), the primary and secondary DNS server, and the supported IP QoS (Background IP, 32K/64K Streaming IP)</li> </ul>
	Secondary Profiles	<ul style="list-style-type: none"> <li>Different Traffic Filtering profile may be attached with different Connection Profile to establish a data session</li> <li>The BGAN core module supports 1 Primary PDP context and up to 10 secondary PDP contexts.</li> </ul>
	Ethernet Operation Mode	<ul style="list-style-type: none"> <li>The Ethernet interface of the BGAN core module supports 3 operation modes, Bridge Mode, Router Mode (Single User) and Router Mode (Multi-User). (NOTE: Router Mode (Multi-User) is using NAT function)</li> <li>If configured with Bridge mode, the PPP request shall be initiated by a computing device connected to Ethernet or Bluetooth (OPTIONAL) interface.</li> <li>If configured with Router Mode, the PPP request shall be initiated by the BGAN core module, which allows standard TCP/IP communication between the Ethernet interface and the computing device</li> <li>The Web Console also allows the user to configure the behaviour of Router mode data session (to automatically make a data connection upon power up or to start data connection setup upon user action)</li> </ul>
Messaging	Port Forwarding	<ul style="list-style-type: none"> <li>Allows user to set NAT Port forwarding configuration</li> </ul>
	Folder	<ul style="list-style-type: none"> <li>Support 3 SMS folders: Inbox, Drafts and Sent.</li> <li>Support listing of SMS with header information (Sender, Subject, Date &amp; Time Sent/Received,)</li> </ul>
Settings	Security/PIN Lock	<ul style="list-style-type: none"> <li>Enable/Disable USIM PIN, USIM PIN2 and UT PIN</li> </ul>
	Security/Web Console	<ul style="list-style-type: none"> <li>Redefine the administrative password to log on to the Web Console</li> </ul>
	Interface/Ethernet	<ul style="list-style-type: none"> <li>Turns the Ethernet interface On/Off</li> <li>Reassign the local IP address</li> <li>Enable/Disable the built-in DHCP server and define the IP range and the leased time for IP assignment</li> </ul>
	Interface/Bluetooth	<ul style="list-style-type: none"> <li>Turns the Bluetooth AP On/Off</li> <li>Redefine the Device ID of the BGAN core module or to use default Device ID</li> <li>Configure the accessibility (to be able to be discovered? allow connection from all devices or only paired devices?) from other Bluetooth devices</li> <li>Enforce authorization or authentication (with passkey), or both</li> </ul>
	Interface/RJ11	<ul style="list-style-type: none"> <li>Configure the BGAN core module with a Caller ID standard supported by the external 2-wire phone</li> </ul>
	Others	<ul style="list-style-type: none"> <li>Allow the user to reset the configuration back to factory defaults</li> </ul>

#### 4. Compatibility with Inmarsat LaunchPad

The BGAN Core Module is fully compatible with LaunchPad, a common MMI from Inmarsat, to support configuration and functions of the BGAN terminal.

#### 5. Device Drivers

Type	Interface	Description
Core Module	UART	<ul style="list-style-type: none"> <li>▪ Optional Bluetooth Stack (v 1.2) supporting following profiles: Generic Access Profile, Service Discovery Application Profile, Serial Port Profile, Headset Profile (Audio Gateway), Cordless Telephony Profile (Gateway)</li> <li>▪ Requires the optional Bluetooth Module</li> </ul>
Client Access	Ethernet	<ul style="list-style-type: none"> <li>▪ IEEE 802.3 10 Base-T</li> <li>▪ Allows Internet access via Ethernet port</li> </ul>
	Bluetooth	<ul style="list-style-type: none"> <li>▪ Allows Internet access from Bluetooth-enabled computing device</li> <li>▪ Requires the optional Bluetooth Module</li> </ul>

#### 6. Supported Internet Applications

Application	Protocol/Standard
VPN Client	Based on PPTP, L2TP and IPSec
VoIP	H.323 and SIP
FoIP	T.37 and T.38
MPEG Streaming	H.263 and H.264
Email	POP3, SMTP and IMAP
Messaging	Yahoo! Messenger, MSN Messenger, Skype, Google Chat
Conferencing	Microsoft Netmeeting
Web Browsing	HTTP and HTTPS

### DEVELOPMENT OPTIONS

Addvalue provides several options for developers based upon the level customization required to support the intended application.

#### 1. Direct Integration

Integrating the BGAN Core Module directly into your application without any need to modify the standard hardware or software. The BGAN Core Module will come in its standard hardware configuration with all standard interfaces and standard Addvalue software (including UT MMI and Web Console).

#### 2. Direct Integration with Customization

Integrating the BGAN core module with the need to customize the UT MMI Software Module and the Web Console, or build your own application around these two modules. The BGAN Core Module will be shipped in its standard hardware configuration with all standard interfaces and Addvalue's core software. Developers are expected to perform their own customization on the UT MMI Software Module and Web Console. For this option, developers must purchase the Development Kit, Application-Layer Software Development Kit and Addvalue's Development Support Package and Training Programme.

### **3. Complete Integration & Development**

Integrating the BGAN core module with the intention to build a customized application interface involving the UT MMI and Web Console, plus possible change in the Layer 2 stack of the BGAN Core Module. For this option, developers must purchase the Development Kit, Application-Layer Software Development Kit, Layer-2 Software Development Kit, and Addvalue's Development Support Package and Training Program.

In all the above cases, the Inmarsat BGAN type approval at system level is mandatory and Addvalue shall provide such engineering verification service package.

#### **For further information please contact:**

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