

# GTD-ARM16-24

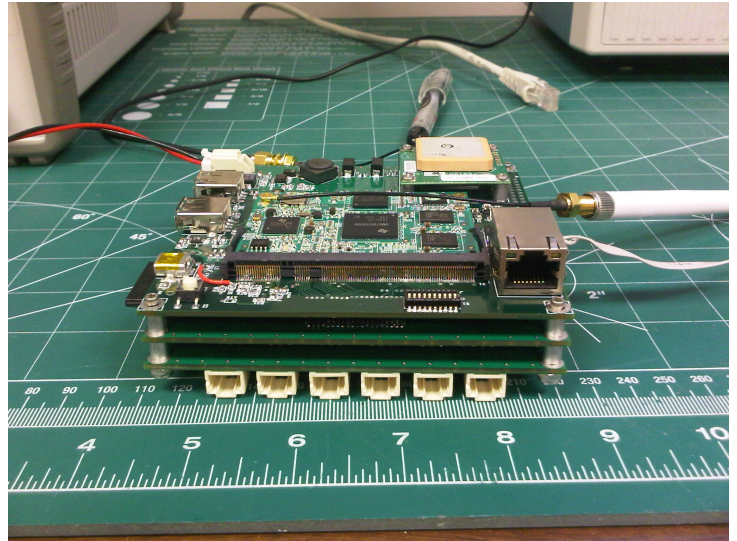
## Multipurpose Data Acquisition Unit

### Applications

- Local and Remote
- Broadband
- Aftershock
- Active Source
- Micro-Zonation Survey
- Site Noise Survey

### Features

- State-of-the-art ADC for BB/SP Seismometers
- Extremely low-power
- Small size, lightweight, and customizable
- Modular hardware and software
- IP communications via Ethernet and asynchronous serial
- Embedded/removable mass storage
- Synchronized data acquisition across multiple units



## OVERVIEW

A high-precision device intended for scientific applications that need low power, accurate position and time, the GTD-ARM-16-24 provides 16 channels simultaneously sampled with 24-bit precision.

Its system clock is GPS synced. GTD's innovative design synchronizes ADC clocks across multiple units. As a result data is synchronized which allows for greatly simplified post processing.

It has ethernet and 802.11 b/g wifi, which can be utilized for remote access to data and device settings . It has an 1 GHz ARM A8 processor with a DSP for any real-time processing needs. Storage options include SDXC card, USB thumb drive, or USB hard drive.

Built-in environmental sensors include GPS for location positioning, a tilt-compensated compass with 2 degree accuracy, a pressure gauge, and a temperature gauge. It has a modular design allowing for a custom analog front end. There is also a default AFE that is further detailed in the technical specifications.

For expandability it has 2 USB 2.0, 1 USB OTG, allowing it to act like a USB device when plugged into a computer. It also has a RS-232/485, SPI, and an I<sup>2</sup>C bus to connect to other devices, as well.

Remarkably, under full load, the system consumes ~ 2.5W of power. The low power needs of the GTD-ARM16-24 allows for enhanced portability and extended field deployment.

# HARDWARE SPECS

## Mechanical and Environmental

Size: 4.25" x 4.25" x 1.6"  
 Weight: 0.48 lbs (.22 kg)  
 Operating temperature: commercial, 0-70 c

## Electrical

Input voltage: 6-24v (can be adjusted higher if needed)  
 Power connector: DF1E-2S-2.5C  
 Power consumption: MotherBoard with GPS: ~2.5W  
 ADC Module: Default is 0.14W (see Table for details)  
 Analog Front End (AFE): + ~0.4w  
 802.11 b/g active: + ~0.6w

## A/D Specs

Input channels: 16 (note: channels must be disabled in sets of 4)  
 Input connectors: DF1E-3S-2.5C  
 Input Type: Differential  
 Input Impedance w/AFE: 500M Ohms  
 Input Impedance w/Coupling: DC  
 Resolution: 24-bits  
 Filtering: Analog Low Pass Anti-aliasing set at 65 KHz

## Communications

USB 2.0: (2) Host type-A ports  
 USB OTG: (1) client type AB port  
 GPIO: 8 lines  
 RS232 (with flow control)  
 RS485 (half and full duplex)  
 McBSP  
 McSPI  
 I<sup>2</sup>C  
 802.11 b/g WLAN  
 Ethernet (10/100)

## System Specs

CPU: 1 GHz ARM Cortex-A8, TMS320C64x+ DSP  
 OS: Linux 2.6.23  
 Onboard Storage: 512 MB DDR, 512 MB NAND  
 SDIO: supports up to SDXC  
 GPS: -160dBm tracking sensitivity, -148dBm acquisition sensitivity, position accuracy <2.5m, altitude accuracy <5m, PS +/-60ns Heading accuracy 2 deg, Heading Resolution 0.1 deg, Tilt Accuracy 1 deg, 10Hz update rate 300 to 1100 hPa with an absolute accuracy of 0.03 hPa  
 Temperature: 0.1 degree C accuracy 0-65 C range  
 Optional Clock Syncing: Clocks across multiple units will be synced within 1 part in 10<sup>^</sup>10 (0.1 ppb).  
 Humidity Sensor:  
 Measurement range: 0-100% RH  
 Absolute RH accuracy: +/- 2% RH  
 Repeatability RH: +/- 0.1% RH

## Dynamic Range

SNR: 141 dB in default configuration. However, the SNR is dependent upon the mode selected plus the analog front end.  
 Common Mode Range with AFE: +/- 5 V  
 Common Mode Range without AFE: +/-2.5V (unipolar)  
 Common Mode Rejection: >110 dB  
 Crosstalk with AFE: -125 dB  
 Crosstalk without AFE: -107dB

	Low Speed	Low Power	High Resolution	High Speed
Power Per Channel (mW)	7	31	64	70
Sample Rate (kHz)	10.547	52.724	52.734	144.531
SNR (dB)	107	106	110	106
Input Impedance w/o Analog Frontend (k ohm)	140	28	14	14



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