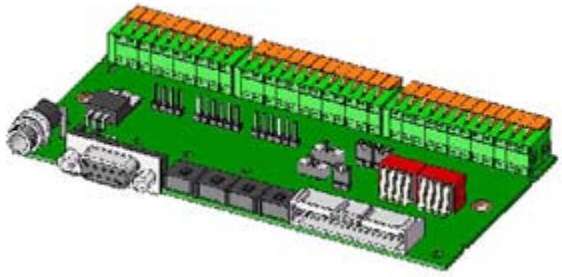
MultiConnect™ OCG

Break-Out Board



Developer's Guide

MultiTech Systems

MultiConnect OCG Break-Out Board Developer's Guide

Models: MTOCG-BOB

S000518A, Version A

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Revisions

Revision	Date	Description
A	11/04/11	Initial release

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MultiConnect OCG Break-Out Board

The MultiConnect OCG Break-out Board (BOB) is designed to be used with MultiConnect Open Communications Gateways and the Multi-Tech Cellular Development Platform. It provides a quick and easy way to simulate your application environment, exercise common analog and digital inputs, and quickly complete general purpose connections using the GPIO cable and quick-connects.

Features

- GPIO cable and GPIO connectors simplify testing needs
- Four analog potentiometers simulate sensor inputs
- Eight physical switches simulate digital signal inputs
- Additional jumpers enable additional power and ground options
- Desktop mounted

Developer Kit Contents

The MultiConnect OCG Break-Out Board ships with the following:

- MTOCG-BOB Break-out Board
- GPIO Cable
- Power transformer with region specific blades (NAM, GB/IE, EU)

Design Notes

The BOB is a pass through board with the option of driving signals on the board.

- Includes headers for plugging in SPI or I^2C devices
- Onboard supply has quick connect terminals and is protected from shorts and over current conditions by a 500 mA resettable polyfuse.
- Allowable input supply is 7VDC to 32VDC
- Quick connect terminals can handle 26 AGW to 18AGW wire sizes

Connections

36-pin GPIO Input	Molex plug
Power	2.5mm miniature screw
Serial Input	RS-232, DE-9 female
GPIO Output	34 individual quick-connectors
I^2C	4-pin header (in addition to quick-connectors)
SPI	Two 6-pin headers (in addition to quick-connectors)

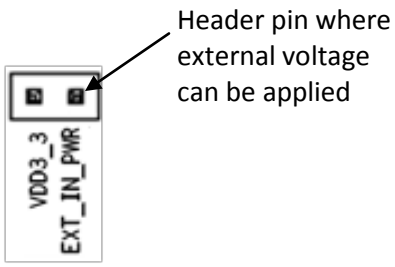
Operating Requirements:

Operating Temperatures	-30° C to +85° C
Storage Environment	-40° to +85° C
Humidity	20% to 90% non-condensing

External Input Section

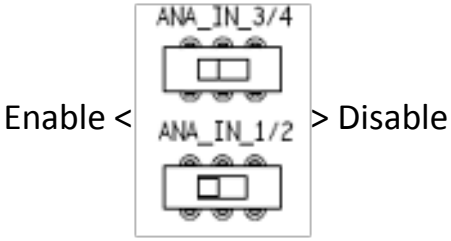
The onboard circuitry associated with the external inputs lets the user apply a voltage level to each external input. A jumper between the switches and the BOB power supply lets the user disconnect the switches from the BOB power supply. When this jumper is removed, 3VDC-30VDC external voltage can be applied to the DIP switches, through the EXT_IN_PWR pin of the header.

A second jumper lets users isolate the external input ground from the BOB ground. The switches are SPST. The BOB is designed so that when the switches are in the OFF (down) position the external input pins are not driven by the BOB.



Analog Input Section

The onboard circuitry associated with analog inputs lets the user apply an adjustable voltage between 0 and 3.3VDC to each of the analog inputs. Two switches on the board can be used to connect or disconnect the onboard circuitry from the analog input lines. A jumper lets the user isolate the analog ground from the BOB ground. The voltage sources are 10 k potentiometers connected between the BOB power supply and BOB ground. The analog inputs are connected to the potentiometer wiper pin, through the disconnect switches.



External Output section

The external output section is a direct connection between the 36 pin CDP/OCG connector and the quick connect pin. There is no other circuitry on the BOB in this section. BOB power and ground pins are available on quick connect terminals and can be used to power pull up resistors on the external outputs if needed.

Serial Debug port D9 Female connector

This connector is wired as a RS-232 DCE interface using only pins 2, 3, and 5. A standard serial cable can be used to connect to a PC (not a null-modem cable).

D9 Pin	Signal
2	EXT_DB_TX (output from OGC/CDP unit)
3	EXT_DB_RX (input to OGC/CDP unit)
5	Digital Ground

I²C Bus header

The I²C bus header is an additional access point to the I²C bus. It has power and ground pins as well as I²C Clock and Data lines. This allows a user to plug in an external I²C device, such as a development board from an I²C device manufacturer.

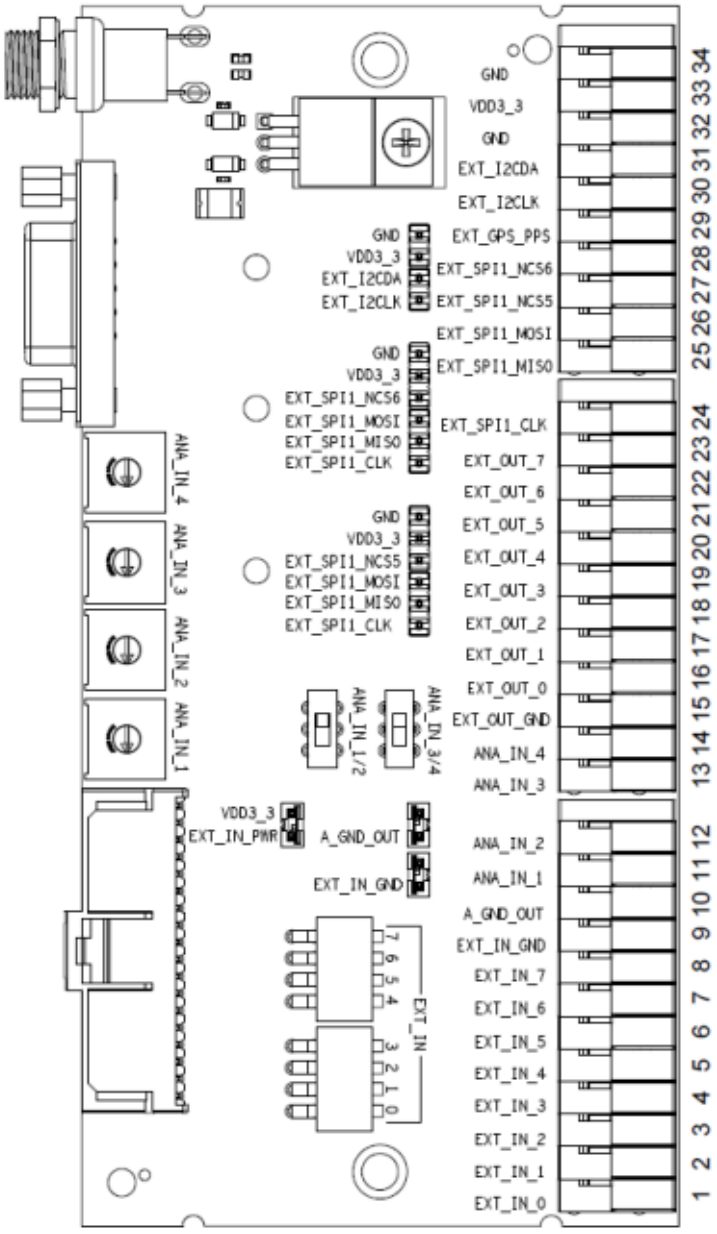
SPI Bus headers

The two SPI bus headers are additional access points to the SPI bus. They have power and ground pins as well as the shared MISO, MOSI, and Clock lines. One header has CS5 routed to it and the other header has CS6 routed to it. This allows a user to plug in an external SPI device, such as a development board from an SPI device manufacturer.

Developer Notes

- The MT100EOCG/MTSMC-CDP-UDK has GPIO11 and GPIO12 functions for pins 7/8 in the 36 pin connector instead of EXT_IN_6 and EXT_IN_7.
- The MT100EOCG/MTSMC-CDP-UDK has pin 35 assigned as GPS-TX. This pin is not brought out to a terminal block pin on the BOB card.

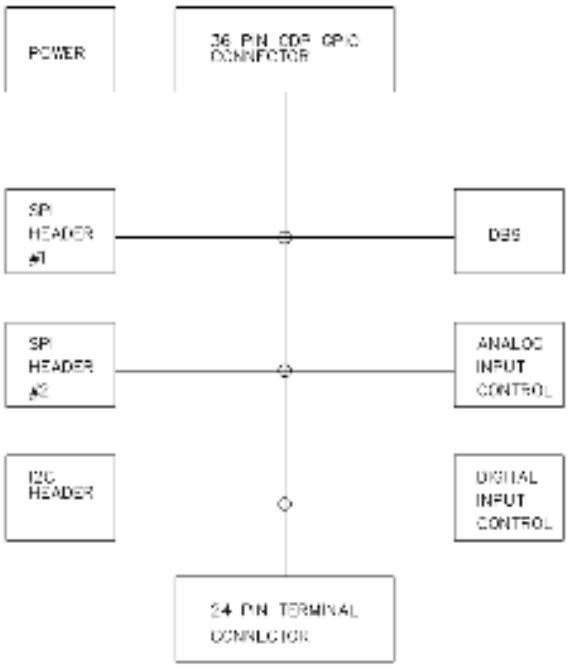
I/O Connector Pin Out



MTCDP I/O Pin	Quick Connect Pin	Function	Function	Quick Connect Pin	MTCDP I/O Pin
1	1	External Input 0	External Input 1	2	2
3	3	External Input 2	External Input 3	4	4
5	5	External Input 4	External Input 5	6	6
7	7	External Input 6	External Input 7	8	8
9	9	Ground – External Inputs	Ground – Analog Inputs	10	10
11	11	Analog Input 0	Analog Input 1	12	12
13	13	Analog Input 2	Analog Input 3	14	14
15	15	Ground – External Outputs	Ground – External Outputs	-	16
17	16	External Output 0	External Output 1	17	18

MTCDP I/O Pin	Quick Connect Pin	Function	Function	Quick Connect Pin	MTCDP I/O Pin
19	18	External Output 2	External Output 3	19	20
21	20	External Output 4	External Output 5	21	22
23	22	External Output 6	External Output 7	23	24
25	24	SPI Clock Out	SPI MISO (Master In/Slave Out)	25	26
27	26	SPI MOSI (Master Out/Slave In)	SPI Chip Select 5 (CS5)	27	28
29	28	SPI Chip Select 6 (CS6)	Debug Serial RXD	-	30
31	-	Debug Serial TXD	GPS PPS (Pulse per Second)	29	32
33	30	I^2C Bus Clock	I^2C Bus Data	31	34
35	-	No Connect	Ground – Digital (SPI, I^2C, Serial)	32	36
-	33	Breakout Board +3.3VDC	Breakout Board GND	34	-

Block Diagram





Connectors

