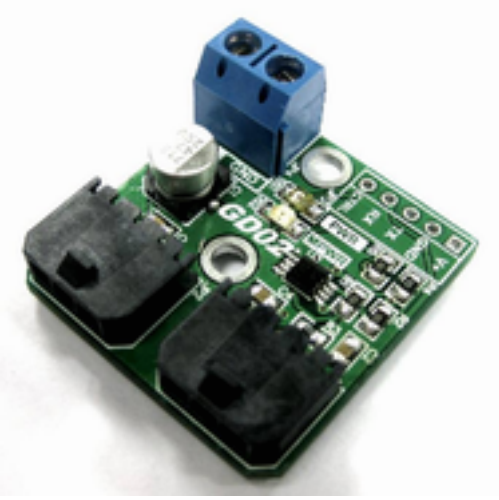
GD02
G15 Driver



User's Manual

V1.0

November 2012

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1.0 INTRODUCTION

G15 Driver (GD02) is a Full to Half Duplex Communication Converter board for controlling Cytron's G15 Cube Servo. It converts UART duplex communication to half-duplex single line communication required by the Cube Servo. GD02 has two ports for Cytron's G15 Cube Servo. G15 Cube servo is serial servo which can be daisy chained for more servos. More than two Cube Servos can be connected Serially to GD02. GD02 has a separated port connector for motor's power supply. GD02 makes simple and easy way for user to control G15 Cube Servo with UART communication from any microcontroller board for example Cytron's SKPIC32, SK40, SK28, SK18 and Arduino's Main Board.

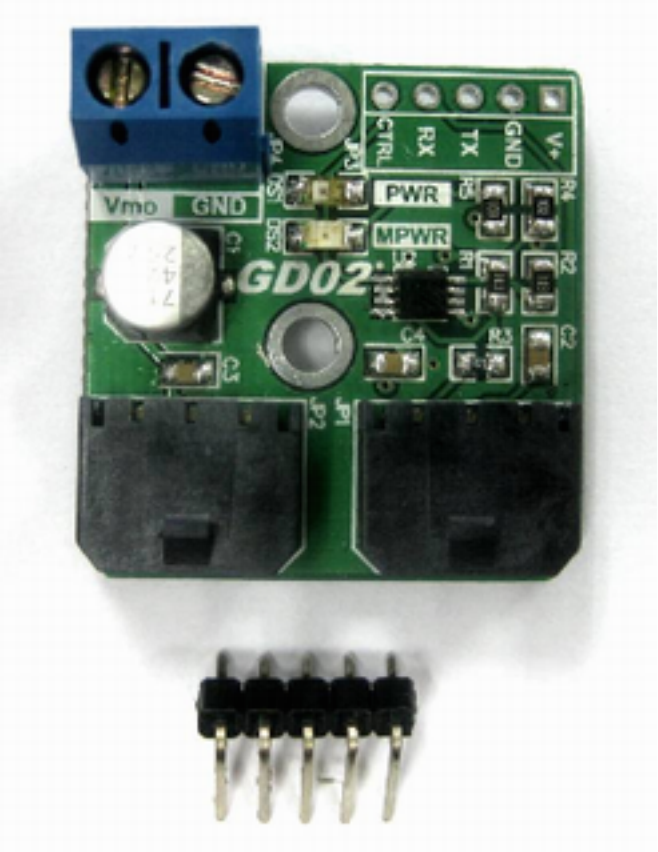
G15 driver comes with:

- 2 x G15 Cube Servo ports (can be daisy chained for more servos)
- External power port for Cube Servo.
- 2 LEDs as logic power and servo power indicators.
- 3.3V and 5V signals compatible.

Note: No protection for wrong polarity. Ensure external power for servo motor is connect correctly to prevent damage to G15 Cube Servo.

2.0 PACKING LIST

Please check the parts and components according to the packing lists. If there are any parts missing, please contact us at **sales@cytron.com.my** immediately.



1. 1 x G15 Driver
2. Right Angle Pin Header (Male) 5 ways

3.0 PRODUCT SPECIFICATION AND LIMITATIONS

Maximum Ratings

Parameter	**Min**	**Typical**	**Max**	**Unit**
Logic Voltage	**3.3**	5	**5**	V
Servo Motor's Voltage	7	12	15	V
Servo Motor's Current			**10**	A

4.0 BOARD OR PRODUCT LAYOUT

1. Motor Power Connector
JP1 is power connector for the servo motor. User need to supply external power for servo motor.

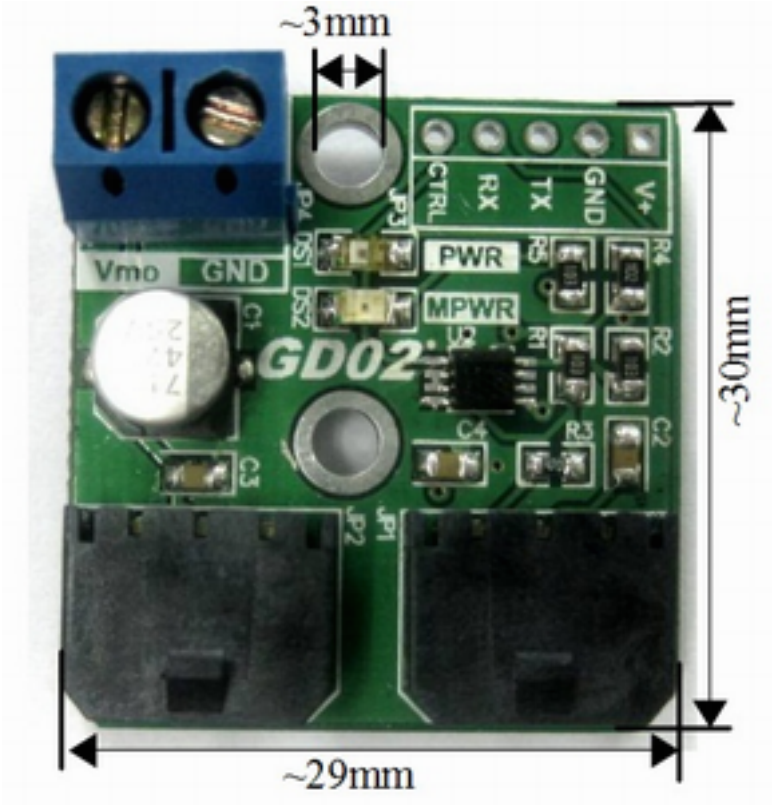
2. Power LED
Power indicator LED for logic power. The LED will turn on when 3.3 or 5V power is supplied to this board.

3. Motor Power LED
Power indicator LED for motor power. The LED will turn on when power for motor is supplied through the Motor Power Connector.

4. Control pins
JP3 is control signals pin to control G15 servo motor. JP3 includes the signal of 5V, GND, TX, RX and CTRL.

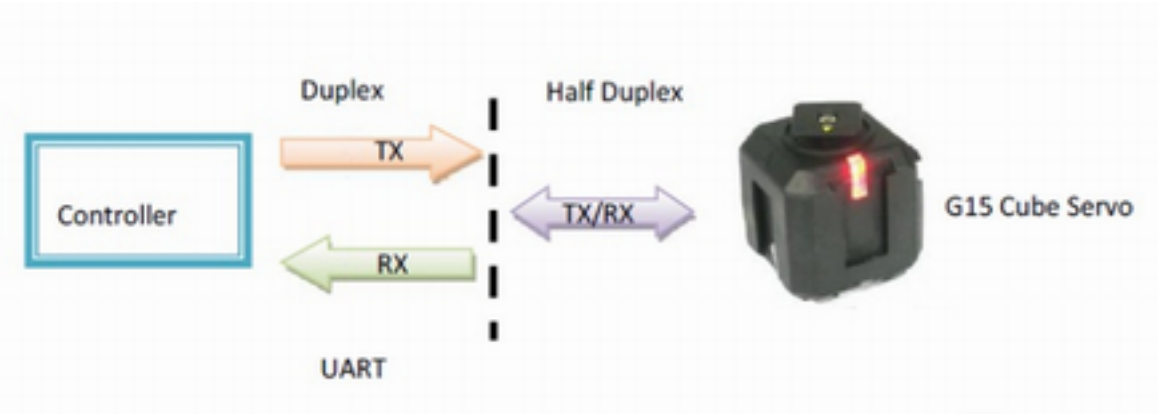
5. G15 Servo port
2 port connectors for G15 servo motor.

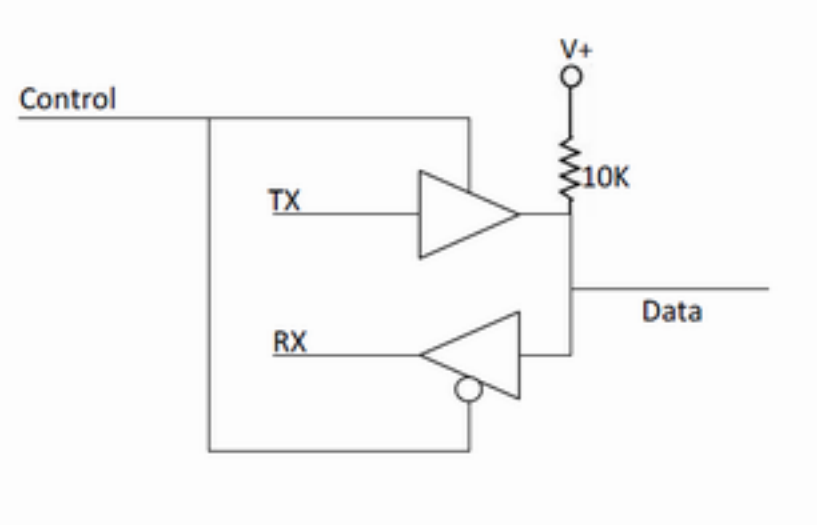
5.0 DIMENSION



6.0 HALF DUPLEX SERIAL COMMUNICATION

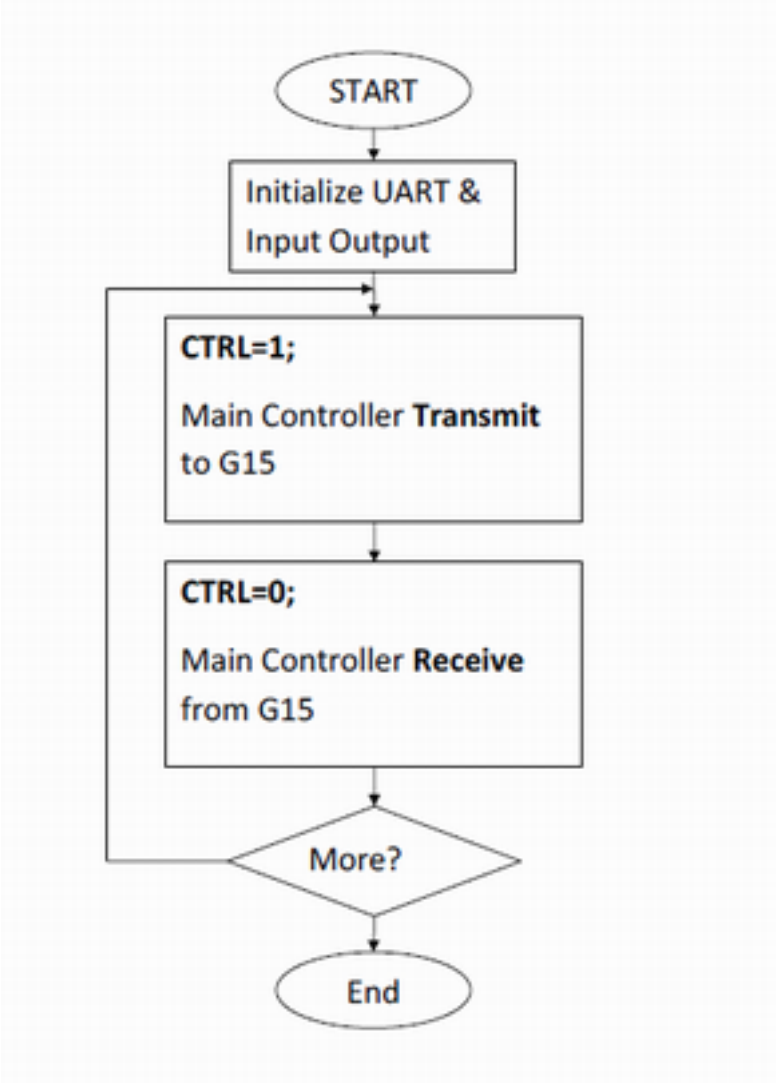
G15 Cube Servo servo is using half duplex serial communication. The communication is standard UART with 8 bit data, 1 stop bit and no parity. There is only one data pin for the half duplex communication instead of 2 pins of normal UART communication. Thus, the main controller as the master will need to have one control pin to switch between transmit and receive mode as shown by the figure below. Besides the TX and RX pin, main controller will need one digital output pin as the control pin. The implementation is as shown by the logic circuit below. TX and RX bus is merged into one single data bus. On G15 driver the control pin is labelled as CTRL. If control pin (CTRL) is **1** then it is in **transmit mode** (transmit data to G15) else if control pin is **0** then it is **receive mode** (main controller receive data from G15).





The following flowchart shows the communication flow for G15 Cube Servo. CTRL is a digital pin of main controller which is connected to general purpose input output pin. For the communication protocol, please refer to G15 Cube Servo's user manual.

GD02 Half Duplex Communication Flow

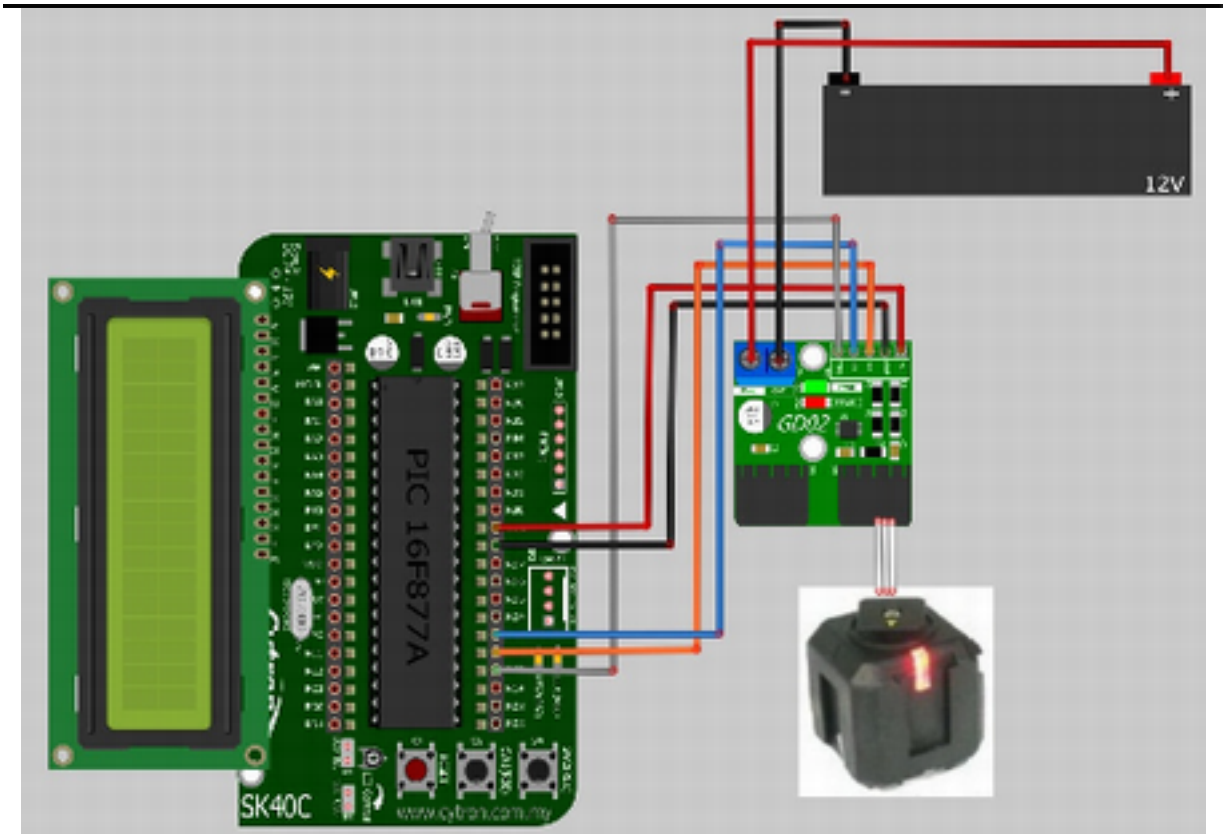


7.0 HARDWARE INTERFACE

The Figure below is sample hardware interface between GD02 and main controller. External power is needed to supply power for G15 servo motor. TX and RX pin of GD02 is connect to TX and RX pin of SK40C respectively. CTRL pin of GD02 is connect to any GPIO pin for example RC5 as a control pin.

Signal Connections:

Main Controller	**GD02**
5V or 3.3V	V+
GND	GND
UART-TX	TX
UART-RX	RX
GPIO	CTRL



8.0 WARRANTY

- Product warranty is valid for 6 months.
- Warranty only applies to manufacturing defect.
- Damaged caused by miss-use is not covered under warranty
- Warranty does not cover freight cost for both ways.

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