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Electronics Prototyping, Custom Design, Product Development

ICON H-Bridge Errata Document

1.0 Revision 0x0D (decimal 13) Firmware – The following errors can be found in revision 0x0D firmware only.

1.1 STATE register DISABLED bit

Problem – The De-energize command clears the STATE, DISABLED bit. Therefore it cannot be used to determine the state of the H-Bridge. The bit is set when a fault occurs (over-temperature or over-current condition) but is cleared when either an Energize or De-energize command is received by the ICON H-Bridge.

Work Around – Maintain the ICON H-Bridge on/off state in the master unit and verify that the H-bridge is enabled by monitoring the AMPS register.

1.2 CALIBRATE AMPS, CALIBRATE TEMP registers

Problem - The calibration registers are added directly to their associated registers (AMPS or TEMP). The highest bit is not used to denote subtraction, and rollover conditions are not accounted for.

Work Around – Use only small numbers for these registers and ensure that your system will not cause a rollover condition. For example, if CALIBRATE AMPS is equal to 0x05 then be sure your system does not measure current greater than 25 amps, otherwise the result will rollover to a number close to zero.

1.3 ADDRESS register

Problem - The ADDRESS register is changed on the fly.

Work Around – When changing the ADDRESS register ensure that all subsequent communication is at the new address value.

2.0 Revision 0x0D (decimal 13) and above Firmware – The following errors can be found in revisions 0x0D through 0x0F firmware.

2.1 BAUD register 9600BPS setting

Problem – Some users may fail to get a response back from the ICON H-Bridge when implementing serial communication at 9600BPS.

Work Around – Write the controlling firmware or software to perform a retry when communication fails. Alternatively, you may reduce your baud rate to 2400BPS or 4800BPS.

2.2 Datasheet Clarification

– Section 4.3 of the ICON H-Bridge datasheet says “As mentioned above, while in direct drive mode serial communication is not possible. The only way to exit direct drive mode is to short the connection on the top side of the ICON H-Bridge marked “DDE” for direct-drive-escape” and power up the device. This can be done by placing a small conductor (such as a screw driver tip) across the two pads, and applying power to the ICON H-Bridge. Once powered the conductor should be removed. Shorting the “DDE” pads enables the H-bridge and this process of escaping direct drive mode should be done with the load (motor) disconnected, and all control line pulled low or disconnected.”

See also section 3.1.

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The following text should be added.

“Once powered up with “DDE” shorted, and after the short is removed, serial communication to the H-bridge is possible. To disable direct drive mode permanently you should implement a Store command via the H-bridge serial interface. Otherwise the direct drive enable bit located in the Function register will be reloaded when the device is powered up again.”

3.0 Revision 0x12 (decimal 18) and above Firmware – The following changes in functionality can be found in these firmware revisions.

3.1 Direct Drive Escape

The firmware has been modified so that if the ICON H-Bridge is operating in direct drive mode, and it is powered up with the DDE (direct drive escape) pads shorted the ICON H-Bridge will revert to serial control mode, and store this new configuration setting in EEPROM (the baud rate will also be changed to 2400BPS). Previously the user would have to implement a STORE command in order for serial mode to become the default power-on operating mode. This fix eliminates the need for the datasheet clarification described in section 2.2 of this errata sheet. In addition when the direct drive escape pads are shorted on power up the baud rate will be reset to 2400BPS.

3.2 Baud Register Settings

Due to oscillator frequency variability in the microcontroller used on this product serial communication at 4800BPS and 9600BPS can be problematic. It is recommended that only 2400BPS be used. If you program the baud rate for communication at a rate other than 2400BPS and lose communication with the device you can externally reset the baud rate to the 2400BPS default. To do this remove power from the system, short the pads labeled DDE on the top side of the ICON_HB, and apply power to the system. The baud rate will be restored, and the EEPROM will be updated with the new setting.