

# Hytec IP-ADC-8413

## IPAK ADC Board Issue 3

### SLAC Averager Upgrade Rework Instructions (assembled board)

JED/SLAC/11-26-2007

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#### Introduction:

This document gives instructions for modification of the Hytec IP-ADC-8413 16 Channel ADC Industry Pack board. These modifications reduce the ADC input anti-aliasing low-pass filter cutoff frequency from 75KHz down to 100Hz, with the new capacitor values chosen. This is accomplished by changing the two capacitor values of each ADC channel's 2-pole active sallen-key filter circuit. In addition, the modifications also add a hardware signal averaging capability to the module by changing the FPGA's gateware and on system clock rate. This is accomplished by changing the FGPA configuration PROM and the board crystal oscillator, respectively.

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#### Instructions:

1) Capacitors – Group 1 (old value = 330pF)

a) **REMOVE** the following capacitors (these are noted in **CYAN** in the assembly drawing):

- ❑ C101
- ❑ C201
- ❑ C301
- ❑ C401
- ❑ C501
- ❑ C601
- ❑ C701
- ❑ C801
- ❑ C901
- ❑ C1001
- ❑ C1101
- ❑ C1201
- ❑ C1301
- ❑ C1401
- ❑ C1501
- ❑ C1601

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b) **INSTALL** new **0.1uF** 0805 capacitors in their slots: (these are noted in **CYAN** in the assembly drawing):

- **C101**
  - **C201**
  - **C301**
  - **C401**
  - **C501**
  - **C601**
  - **C701**
  - **C801**
  - **C901**
  - **C1001**
  - **C1101**
  - **C1201**
  - **C1301**
  - **C1401**
  - **C1501**
  - **C1601**
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2) Capacitors – Group 2 (old value = 180pF)

a) **REMOVE** the following capacitors (these are noted in **GREEN** in the assembly drawing):

- ❑ C102
  - ❑ C202
  - ❑ C302
  - ❑ C402
  - ❑ C502
  - ❑ C602
  - ❑ C702
  - ❑ C802
  - ❑ C902
  - ❑ C1002
  - ❑ C1102
  - ❑ C1202
  - ❑ C1302
  - ❑ C1402
  - ❑ C1502
  - ❑ C1602
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b) **INSTALL** new **0.047uF** 0805 capacitors in their slots: (these are noted in **GREEN** in the assembly drawing):

- ❑ **C102**
- ❑ **C202**
- ❑ **C302**
- ❑ **C402**
- ❑ **C502**
- ❑ **C602**
- ❑ **C702**
- ❑ **C802**
- ❑ **C902**
- ❑ **C1002**
- ❑ **C1102**
- ❑ **C1202**
- ❑ **C1302**
- ❑ **C1402**
- ❑ **C1502**
- ❑ **C1602**

3) Crystal Oscillator

- a) **REMOVE** OSC1, the 16.000MHz crystal oscillator
  - b) **INSTALL** new **15.360MHz** crystal oscillator (CTS part # CB3LV-3C-15M3600) into OSC1 slot – note pin 1 location!
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4) FPGA Config PROM

- a) **REMOVE IC11** from its socket. Note that it is marked with a label reading “8413 V301”.

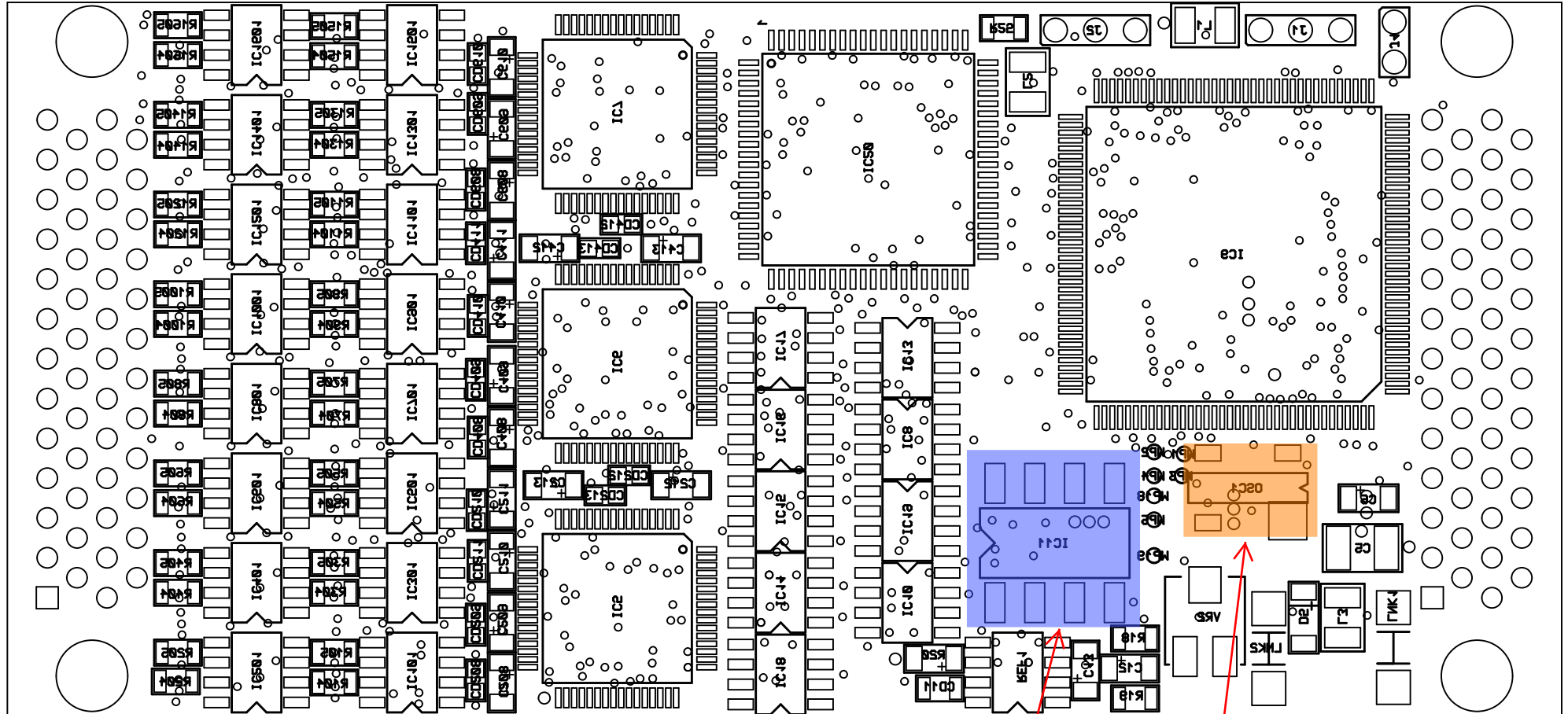
**INSTALL** newly-programmed Atmel AT17LV010 PROM into IC11 socket. Note that this device should have a **ORANGE** sticker on it indicating that it has been programmed.

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5) Marking

- a) Affix an **ORANGE** adhesive dot on the board to indicate that it has been modified.
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VIEW ON TOP SIDE



IC11 - Replace

OSC1 - Replace

Cyan = 0.1uF

Green = 0.047uF