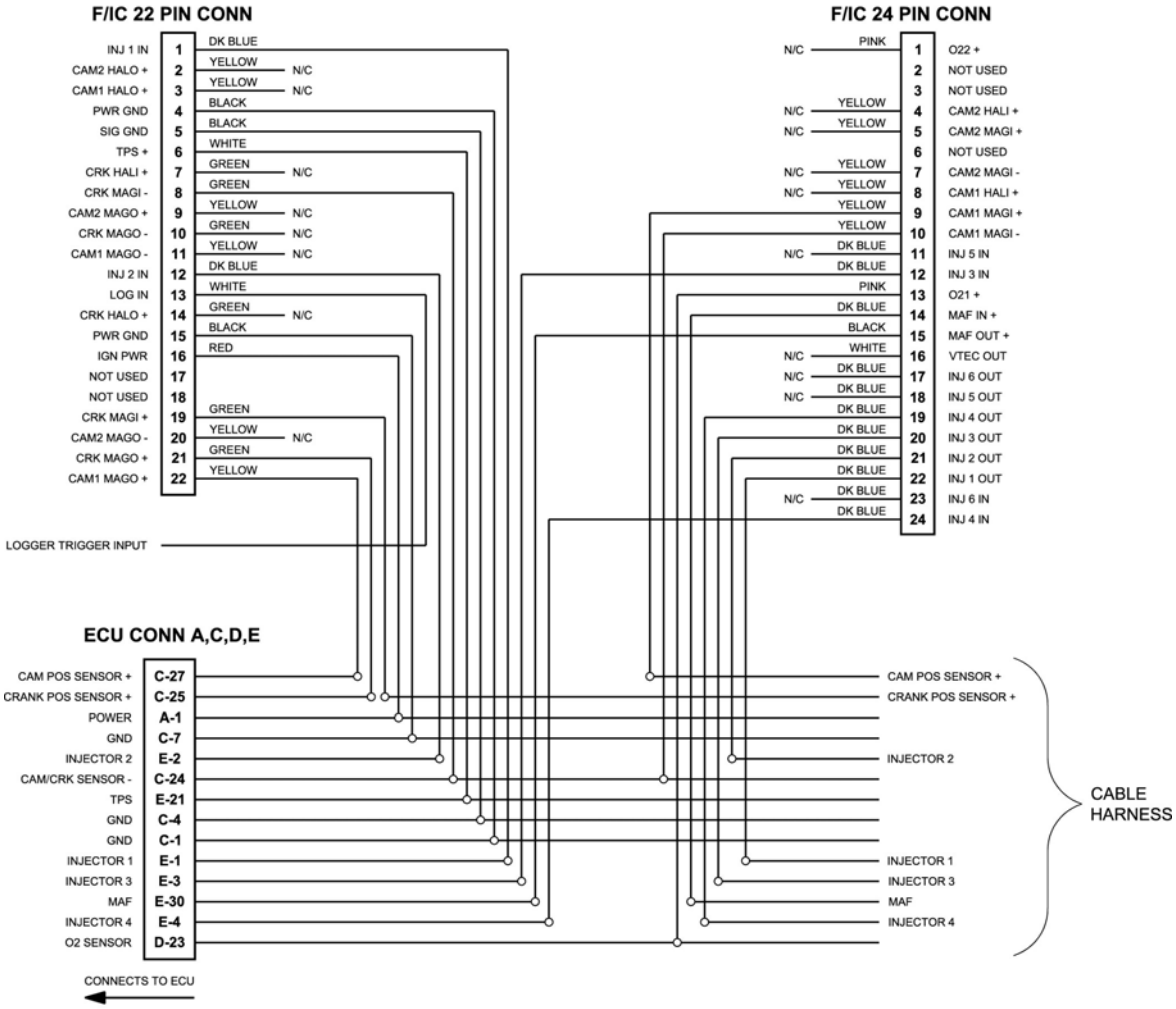
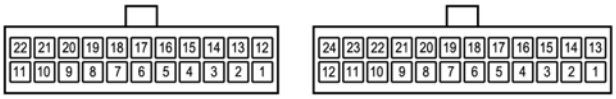
F/IC Quick Start Guide/Tuning Tips
2005-2006 Scion tC
F/IC P/N 30-1910



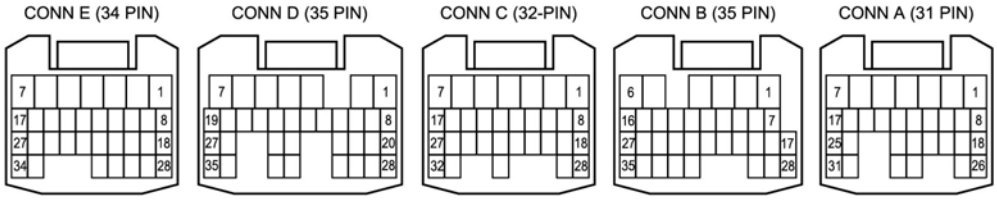
Suggested Tools:
Multimeter
OBDII Scanner

F/IC CONNECTOR PIN NUMBERS



LOOKING AT WIRE SIDE OF CONNECTORS

ECU CONNECTOR PIN NUMBERS



LOOKING AT WIRE SIDE OF CONNECTORS

F/IC OVERVIEW
The new Fuel/Ignition Controller from AEM Performance Electronics is a powerful tuning tool, designed to allow the addition of forced induction intake systems on normally aspirated, computer controlled race vehicles.

By design, the new F/IC is a "piggyback" style ECU that works in conjunction with the factory ECU. Thus, the key to allowing your engine to run at its full potential is making the F/IC work in harmony with the factory ECU. As technology advances, factory ECU's are getting smarter. Most modern OBD-II ECU's are capable of recognizing even the slightest fuel changes and will quickly "correct" the fuel quantity. In order for the F/IC installation to be successful, the engine must be tuned so the closed loop factory fuel conditions remain the same. When in closed loop, the factory ECU will undo any change in fuel quantity you attempt to make. If you try and fight the factory ECU you will not be successful.

1) WIRING THE F/IC
Install the FIC into your vehicle using the wiring diagram provided on the first page. To make the install easier, and to save the factory harness from being cut, the use of an AEM Plug n Play FIC harness or Patch/Extension harness is recommended. The harness part numbers are listed below.

Plug n Play Harness: 30-2913
Patch/Extension Harness: 30-2992

2) Boost Reference
Connect the pressure port on the front panel of the FIC to an adequate intake manifold pressure source (downstream of the throttle body) using the supplied boost hose, tee fitting, and zip ties.

3) Configuring the F/IC
Download the FIC software from the AEM Performance Electronics forum at http://forum.aempower.com/forum/index.php/topic,26751.0.html. The FIC supplied in the kit is preloaded with the basemap listed below. Open the F/IC software and go to File>Open and direct the software to the Basemap (C:program files/AEM/FIC/Basemaps) listed below.

Basemap: Basemap 30-1960 Scion tC 05-06 Stock Injectors 4100

Connect the F/IC to the computer using the supplied USB cable and allow the USB drivers to load. In the F/IC software, go to ECU>Connect. When the Cal File Mismatch window appears, click on the button "From F/IC" to connect. The basemap contains very conservative fuel and timing maps, along with the necessary MAF/MAP/O2 settings. The basemap is intended to get your engine running, and point you in the right direction for tuning. It is NOT a fine tuned map for your vehicle. **Further tuning is required**.

4) STARTING THE ENGINE
Before starting the car, it is a good idea to disconnect the battery and allow the factory ECU fuel trims to reset. This usually happens within 5 minutes of disconnecting the battery. Start the vehicle and allow the engine to idle while monitoring fuel trims with an OBDII style scanner. Adjust the values in the fuel table until the fuel trims are as close to zero as possible.

5) TUNING RECOMMENDATIONS
Visit the video gallery at www.aempower.com for F/IC instructional videos.
All tuning should be performed on a suitable chassis dyno, using an Air Fuel Ratio (AFR) monitoring device such as the AEM 30-4100 Digital Wideband UEGO Gauge, or the 30-5130 Analog Style Wideband UEGO Gauge. For datalogging and easy AFR reference, the analog output (White wire on gauge harness) from either of the Wideband UEGO Gauges can be connected to the F/IC using the unterminated Brown wire labeled "UEGO" on the 30-2913 PNP FIC Harness.

6) FUEL TUNING

Factory ECU's have two running modes Open Loop (ECU does not trim fuel based on feedback from O2 sensors) and Closed Loop (ECU trims fuel based on feedback from O2 sensors). There is no "switch" or magical button on the F/IC that will force the factory ECU to operate in either mode.

Open Loop Fuel Tuning

Fuel adjustments for open loop running conditions are made in the fuel map. A change in the fuel map will result in a change in AFR.

Closed Loop Fuel Tuning

Closed loop fuel tuning requires a bit more work. Fuel adjustments for closed loop running conditions are made by corresponding changes in both the Fuel map and the O2 map. Adjustments in one map only will result in a temporary AFR change and large fuel trims. Adjustments made in both maps will result in a permanent AFR change and factory like fuel trims.

The table below can be used as a closed loop AFR target guide. The target AFR is listed in the left column. The factory ECU will target the listed AFR when the corresponding value is entered into the O2 map. NOTE: The fuel map will need to be adjusted in order to maintain low fuel trims. Using the OBDII scanner, monitor the fuel trims live while making adjustments.

TARGET AFR	O2 MAP VALUE
14.7	3.2
14.0	2.9
13.8	2.8
13.6	2.7
13.5	2.6
13.3	2.5
13.2	2.4
13.1	2.3
13.0	2.2
12.9	2.1
12.8	2.0
12.7	1.9
12.6	1.8
12.5	1.7
12.4	1.5
12.3	1.4
12.2	1.3
12.1	1.2
12.0	1.1
11.9	1.0
11.5	0.63
11.0	0.29

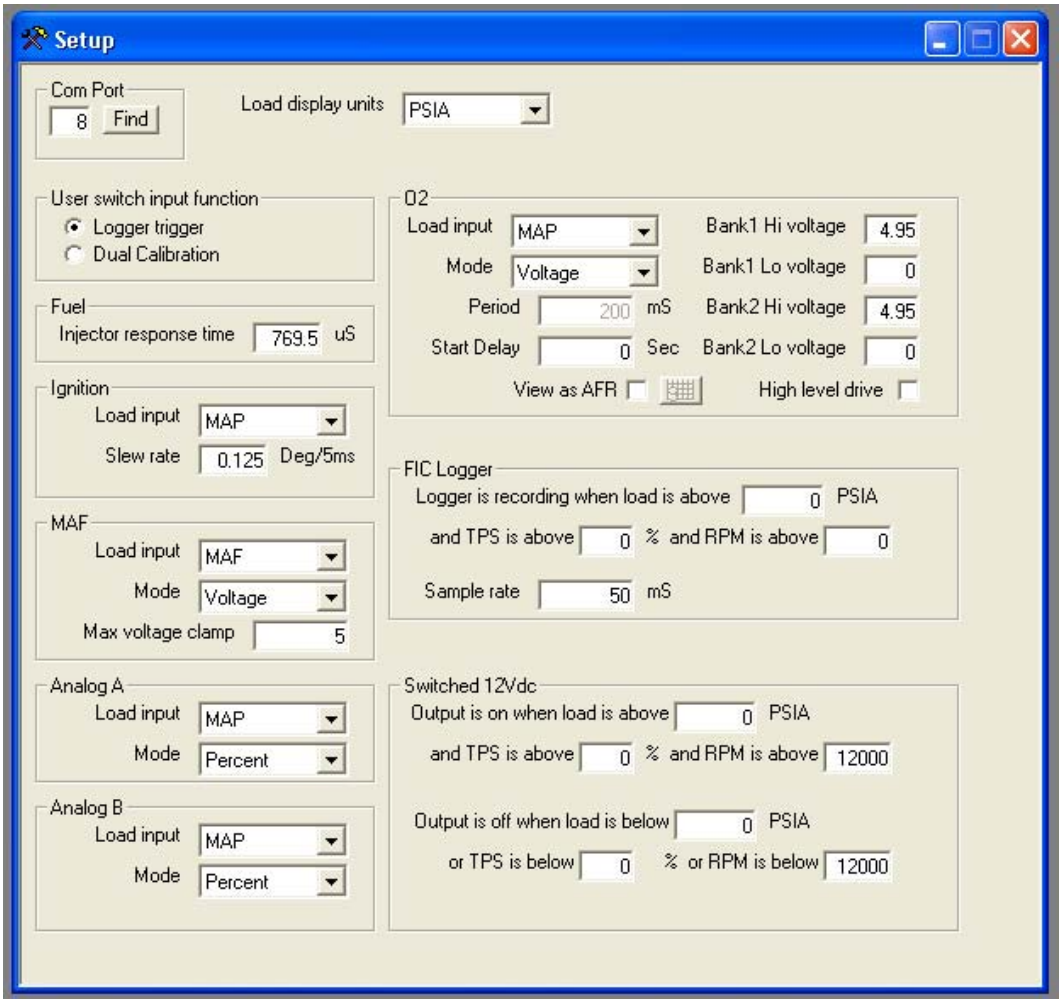
If further tuning help is needed be sure to visit the video gallery at www.aempower.com for comprehensive instructional videos.

7) Vehicle Specs:

F/IC PLUG & PLAY KIT	30-1960
F/IC	30-1910
F/IC PLUG & PLAY HARNESS	30-2913
PATCH/EXTENSION HARNESS	30-2992
CRANK SENSOR (MAG/HALL)	MAG (2 WIRE)
CAM SENSOR (MAG/HALL)	MAG (2 WIRE)
O2 (NARROW BAND, UEGO, CURRENT SYNC)	CURRENT SYNC
MAP	N/A
MAF	VOLTAGE
ECU LOCATION	BEHIND GLOVE BOX
TRANSMISSION	AUTO/MANUAL
FIRMWARE (Z104, Z107, Z110)	Z1.07

8) Basemap Specs:

MAXIMUM BOOST LEVEL	10 PSI (25 PSIA)
MAF CLAMP	INCLUDED
CLOSED LOOP AIR FUEL RATIO	11:1
IGNITION RETARD	1.5 DEGREES PER PSI OF BOOST
INJECTORS	STOCK
AUX GAUGE CALIBRATION	AEM DIGITAL UEGO GAUGE 30-4100



9) Notes:
The basemap file, along with the values and settings it contains, such as the MAF clamp and O2 values, were developed using a stock vehicle. Be sure to visit the video gallery at www.aempower.com for additional tuning tips and information on the methods used to develop the basemap.

10) Recommended Parts:
30-4100 AEM Digital Wideband UEGO Gauge
30-5130(B/W) AEM Analog Wideband UEGO Gauge
30-4406 AEM Digital Boost Gauge
30-5131(B/W) AEM Analog EGT Gauge
30-5132(B/W) AEM Analog Boost Gauge
30-3000 AEM Water/Methanol Injection Kit

Need additional help? Visit the video gallery at www.aempower.com for additional tuning tips and information. Contact the AEM Performance Electronics tech department at 1-800-423-0046 or tech@aempower.com, or visit the AEM Performance Electronics forum at http://forum.aempower.com/forum/

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