

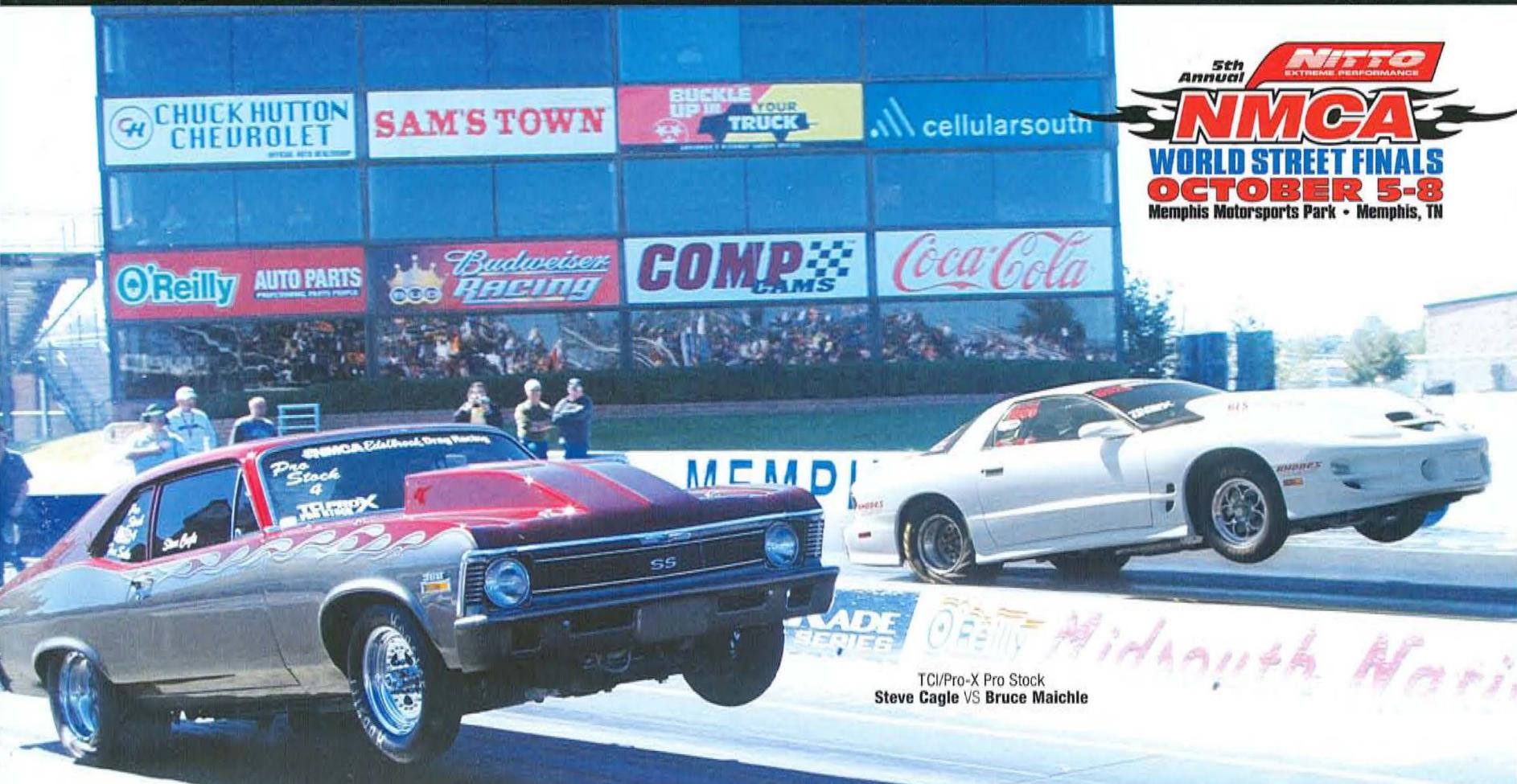
# FSC

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OFFICIAL PUBLICATION  
**NMCA**  
Edelbrock  
DRAG RACING SERIES

INSIDE:  
Edelbrock's  
Pro Port Heads

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# LAST STAND

Nitto World Finals

**PLUS:**

- Accel's Next Gen DFI
- Shakedown at E-Town
- Interview with Bill Glidden



Accel DFI  
Aftermarket Fuel Injection

# DATA

## Accel DFI

GEN VII GROWING BETTER WITH AGE

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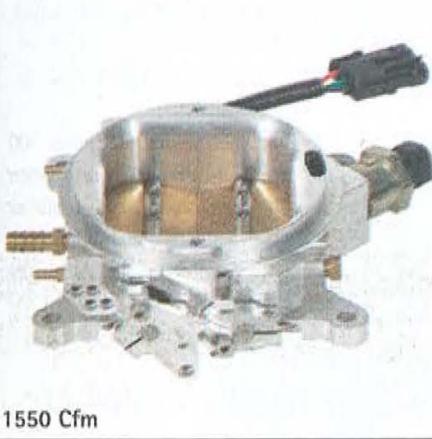
**H**ave a good thing for long enough, and you'll likely begin to take it for granted. With a number of new systems coming to market in the past few years, it is perhaps easy to look past the "old" reliable Accel DFI Gen VII. Though the system has been on the market longer than some of the others, it has undergone continual refinement and enhancement since its initial development began in 1998. The Gen VII DFI is a very robust system with numerous features that make it suited for a wide variety of applications from street to all out race and turbos to nitrous. With guys like Job Spetter Jr., the premier turbo tuner of the current era, and 2004 NMCA Super Street Champ Dan Millen putting the system through the paces, you can be assured that the guys at DFI have been hard at work.

Accel DFI, originally known as just DFI (Digital Fuel Injection) first began developing aftermarket fuel injection systems in the late eighties. Engineers Joe Alameddine, Steve Anton and the rest of the DFI

development team have kept their collective noses to the grindstone, continually refining the Accel DFI product offering for the past several years. While the system was packed with first-to-market features such as scalable RPM and MAP axes, software switchable ignition strategies, quick TPS calibration, VE table generator, shift light output and 3 stages of nitrous control as standard features when it first hit the market, numerous hardware and software updates and supporting hardware from DFI have been implemented to keep the system abreast of the competition. In addition to beefing up the Gen VII box, the folks at DFI have also been hard at work developing supplemental hardware to further enhance the versatility of the Gen VII system.

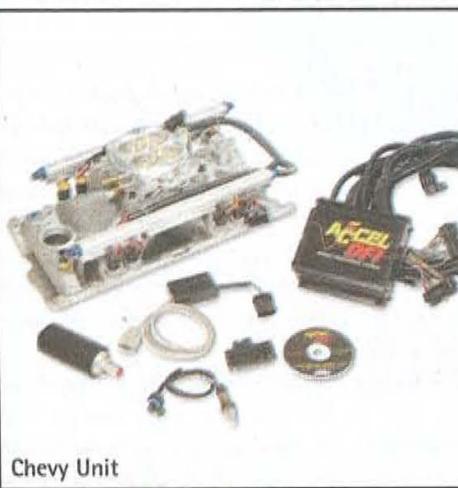
Among the more compelling features of the current DFI Gen VII is the "Boost Builder" feature. This feature sequentially actuates the built-in rev limiter to minimize turbo spooling times. Though it might initially seem counterintuitive, using the rev limiter

Written by Chris Spies  
Behind the Lens: The FSC Staff and Manufacturer



1550 Cfm

Known for using nothing but the best, 2004 NMCA Super Street Champion Dan Millen is one of the NMCA's most prominent proponents of Accel DFI's Gen VII fuel injection, running consistent 7.0's at 205+ with his turbocharged small-block Ford.



Chevy Unit

### the 411

► The answer to those wanting big Dominator type airflow but are constrained to a 4150 manifold, this innovative **1550 cfm** throttle body does the job. Using two opposed rectangular butterflies rather than the traditional 4-barrel arrangement, this unit greatly extends the airflow capabilities of 4150 base applications.

► In addition to their extensive offering of electronics, Accel DFI offers a line of intake manifolds, fuel rails, injectors, regulators and complete kits, such as the small block **chevy unit** pictured here.



to selectively shut off cylinders actually sends a raw air/fuel mixture into the exhaust where it ignites when joining hot exhaust exiting other cylinders and uses the energy to accelerate the turbocharger, which in turn helps the engine to accelerate. Using four user configurable rev limiter steps, which are incremented at user adjustable boost values, turbocharger spool time is greatly reduced. This is particularly helpful in heads-up racing where getting the car off of the line with the turbos spooled is critical. Using a brake switch to actuate the boost builder allows a racer to get the turbos going prior to rolling into the second beam. Equipped with this technology, turbo racers no longer fall prey to starting line burndown tactics sometimes employed by racers looking to get an edge.

Another, more recently developed software feature the guys at DFI are particularly proud of is their four channels of PWM (Pulse Width Modulation) output controls. Each channel includes a user programmable 16 x 16 table (two of which may be configured to utilize RPM or time values vs. MAP levels as inputs) in which users are able to configure control of nitrous solenoids (i.e. progressive nitrous control) or auxiliary fuel injectors. One popular application is on boosted street cars where



Including the components here, the Accel DFI P/N 77062 Wideband O2 sensor and data logger logs up to 16 Gen VII data channels as well as an auxiliary driveshaft speed signal. This unit may also be used as a standalone A/F, Engine RPM and Driveshaft RPM logger.

### What the 77062 Can Do

The 77062 is able to capture 16 channels of data including the following:

- Air-to-Fuel Ratio (selectable from the ECM or the Engine Analyzer).
- Engine Speed (selectable from the ECM or the Engine Analyzer).
- Wheel Speed (via the Engine Analyzer Output Shaft Speed Input).
- Driveshaft Pulse Counts (a function of the Engine Analyzer OSS Input).
- Manifold Absolute Pressure.
- Throttle Position Percentage.
- Ignition Timing Advance.
- Ignition Knock Retard.
- Fuel Injector Maximum Pulse Width.
- Fuel Injector Maximum Duty Cycle.
- Engine Coolant Sensor Temperature.
- Intake Air Sensor Temperature.
- Ignition Voltage Level.
- Closed Loop Fuel Correction Percentage.
- MST Sensor Input Voltage.
- Engine Outputs Status (Fuel Pump, TCC Output, Nitrous State...).

All of the above channels may be recorded anywhere from 10 to 250 times per second. Recording 100 samples/second, the 77062 will store over four minutes of data [or nearly 44-minutes worth when operated at 10 samples/second]. The driveshaft pulse count logging (driveshaft speed) is particularly useful as it helps track clutch or torque converter slippage. The 77062 can also be used as a standalone unit for those running non-EFI setups, particularly if purchased as 77062S which includes the Accel DFI digital A/F meter. For those not content to read just one channel of WBO2 data, the folks at Accel have also rolled out the dual-channel 77063 which does all of the above and also grabs data from a second wideband O2 sensor.

**All of the above channels may be recorded anywhere from 10 to 250 times per second.**

### the 411

▶ Addressing the street/street user's desire to implement sequential fuel injection, Accel developed their line of **dual sync distributors** which contain crank and cam sensors, as well as a pair of indicator LEDs which permit quick setup.

▶ Further expanding the already broad offering of fuel injectors, Accel DFI recently introduced **120 lb/hr injectors** to address those applications that have outgrown 96 lb/hr units, but not quite ready to step up to 160 lb/hr units.



Dual Sync Distributors



120 lb/hr Injectors

pump gas may be used for the primary "driving around," while a second auxiliary cell filled with race fuel may be used to feed the PWM controlled injectors to add octane on demand. While nitrous solenoid control, auxiliary fuel injection and torque converter clutch lockup are some of the more obvious uses of the PWM controls, we speculate that it could also be effectively employed for wastegate control, water-injection or other uses.

In addition to these two popular tools, the current Gen VII software also features an auxiliary launch mode which permits the use of individual spark and fuel maps which may be used to bring the car out of

the hole under reduced power in traction limited applications, such as drag radial and 10.5-inch tire classes. Other standard features available to Gen VII users are injector timing control, ignition dwell management, 3-D individual cylinder trim tables, a VE table generator and much more. Another feature of the new 5.5 software is user programmable MAP limits which permits the usage of any MAP sensor with a linear 0-5V output.

While the software features alone are impressive, the folks at DFI have also been hard at work developing some hardware to support the Gen VII ECU. Perhaps the most anxiously awaited of the Gen

DFI has also developed a series of distributors containing both cam and crank sensors.

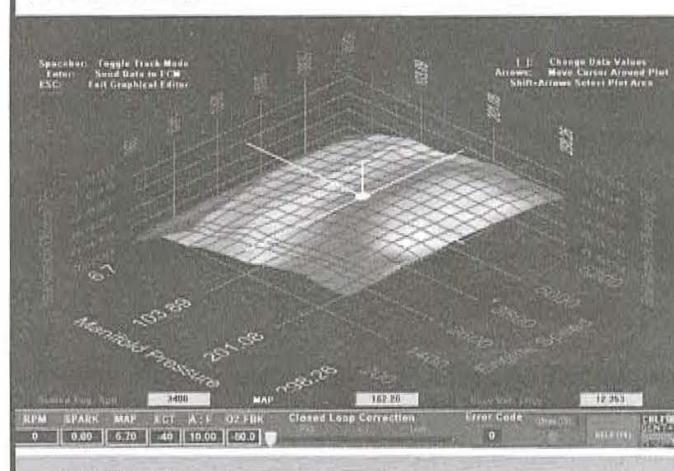
VII devices is their 77062 Data Logger and Wideband O<sub>2</sub> controller. This item, is certainly one of the most long awaited items, particularly in light of the many other wideband O<sub>2</sub> controllers that have come into the marketplace in recent years. This device greatly enhances the capabilities of the Gen VII as it adds much more than wideband O<sub>2</sub> functionality. Introduced late in 2005, the 77062 supports both Bosch and NTK wideband O<sub>2</sub> sensors with the simple flip of a dip switch. Supporting both sensor designs enabled them to capture more cost sensitive users (Bosch) as well as those demanding the precision of the NTK units for a few dollars more (ok, more than a few...). Moving beyond its wideband O<sub>2</sub> capabilities, the 77062 is also a powerful piece of diagnostic equipment when used in conjunction with its internal logging capabilities and Accel DFI's Datamap software package. [Rather than waiting for your laptop battery to die while in the lanes or having lock up as you prepare to roll into the beams.]

For those interested in a turnkey fuel-injection solution, Accel DFI has developed a family of systems which they have dubbed the plug-n-play systems. Using one of these systems, numerous GM crate motors can be fuel-injected and optimally tuned with minimal effort, as the guys at DFI have developed a host of dyno proven EFI packages for use with 350, 454 and 502 ci GM crate engines. Also in the works are plug-n-play kits for Ford, Chrysler and numerous other engine combinations.

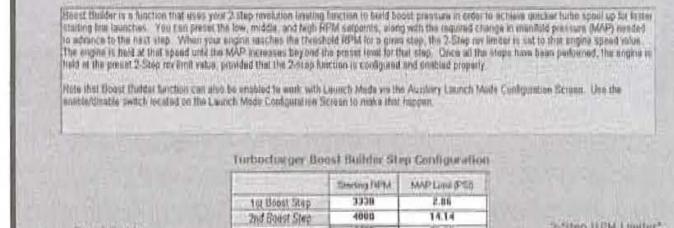
2005 NMRA Super Street Outlaw Champion and true 10.5" world record holder Manny Buginga and tuner Job Spetter Jr. rely on the Gen VII DFI to get the job done on Manny's turbocharged small-block Ford combo.



### A Look Inside



This 3-D table view offers the Gen VII user an adjustable, visual representation of VE, spark and air-fuel tables.



This screen permits Gen VII users to access the powerful boost builder function, a tool which uses the rev limiter to assist with turbo spool-up.



When first entering the Gen VII software, this main dashboard screen gives the user a quick look at a host of key operating parameters.

In addition to the Gen VII systems themselves, DFI has developed a series of distributors containing both cam and crank sensors. These "dual sync" distributors permit the use of sequential injection on many engine designs without interfering with the engine accessory drive, as most sequential retrofits require a crank mounted pickup/trigger as well as a distributor mounted cam sensor. These distributors are available for everything from the standard issue Chevy and SB Ford engines to older Ford FE's, Chrysler Hemis and more. For those of you who have moved on from

distributors, DFI also has their Universal ignition adapter available which supports coil-on/near plug ignitions as well as ECUs configured to operate Ford EDIS equipped and GM LS-1/LS-6 engines. ■

### SOURCE

Accel DFI  
[www.accel-dfi.com](http://www.accel-dfi.com)