INSTRUCTIONS

FAST™ XIM™

Thank you for choosing FAST™ products; we are proud to be your manufacturer of choice. Please read this instruction sheet carefully before beginning installation, and also take a moment to review the included limited warranty information.

XIM™ Unit Installation

The XIM™ unit itself is designed to withstand under hood temperatures but needs to be mounted in a location that allows for some airflow in and around the heat sink. Also keep in mind that the XIM™ is not 100% waterproof and should not be mounted where it will be exposed to direct spray. It is also good practice to mount the XIM™ with the connectors facing down. Typical installation locations would be on the firewall or inside the vehicle cockpit.

Wiring

These wiring installation instructions are specific to the wiring harnesses manufactured by FAST™ only. If you are using a wiring harness other than the ones offered by FAST™, please contact your dealer for instructions for that harness.

FAST™ wiring harnesses are labeled on each of the connectors to simplify installation. Your application may not require the use of all the connectors in the harness. And not all harnesses will include every connection listed below. You may also require additional accessories such as relays, sensors and other specialized connectors to complete your installation. All of these are available for purchase from FAST™.

CRANK:
This connector plugs into your crank pickup. Depending upon your application, it may be found near the harmonic balancer or towards the back of the engine near the flywheel. The crank sensor is used by the XIM™ to determine crank speed and position.

CAM:
This connector plugs into the cam pickup. Depending upon your application, it may be found on the end of one of the cylinder heads or the front of the intake manifold area. The cam sensor is used by the XIM™ to find the start of the firing order.

TO XFI CAM / HALL EFFECT:
This connector plugs into the CAM/HALL EFFECT connector on your FAST™ XFI™ Main Harness. This connection feeds cam and crank signals from the XIM™ to the XFI™. The XIM™ crank and cam outputs are always wired to the XFI™ discrete crank and discrete cam inputs regardless of what type of pickups (inductive or discrete) are connected to the XIM™.

CAN LINK:
This connects to the CAN LINK connection on your FAST™ XFI™ Main Harness. Both the XIM™ and the XFI™ Harness will have a pair of CAN connectors. The plug from one harness will connect to the receptacle from the other harness. It does not matter which pair of connectors is used as long as one pair is mated. This connection can be made through an Interconnect Cable(s) for additional reach. There will be one loose plug and one loose receptacle at either end of the CAN wiring. These loose ends need to be capped off with a Terminating Plug at one end and a Terminating Receptacle at the other. This is absolutely necessary for proper network performance. The XFI™ uses the CAN Link to tell the XIM™ what timing values are called for in the tuning file.

Warning: Before starting your engine (when the XIM™ is being used with an XFI™), make sure that with the ignition switch on, the "Status" light on the XIM™ is illuminated. This indicates that the XIM™ and XFI™ are communicating properly via the CAN network.

Running the engine without proper CAN communication (when the XIM™ is being used with an XFI™) can result in permanent damage to the XIM™ and ignition coils. If the "Status" light is not illuminated, check the following items:

- Verify that the CAN wiring is connected per the provided instructions. One male or female connector from the XFI™ should be connected to a mating connector on the XIM™. The unused male and female connector must have the terminating resistors plugged into them.
- If using an older XFI™ Main Harness that did not come with CAN LINK wiring, verify that the CAN retro-fit kit wires are plugged into the Blue XFI™ main connector as follows: Green wire to pin C26 and the Yellow wire to pin C25.
- Verify that DIP switch 7 in the XIM™ is OFF to select "CAN Enabled".
- Verify that in the C-Com® software for the XFI™, under "Operational Parameters", IPU Ignition is selected.
- Verify that under "System Configuration", CAN Stream is enabled.
- Verify that the XIM™ wire labeled 12V is connected to a 12V source that has power when the ignition switch is in the run position and during cranking.
- If after checking all of these items, you still cannot get a status light on the XIM™, call the FAST™ EFI HELP™ line at 1-877-334-8355 for assistance before starting your engine.

CALPORT:
This connector does not connect to anything during normal operation of the XIM™ unit. It is only used when 'flashing' your XIM™ unit when there is an update available. See 'Flashing your XIM™'.

FLASH:
This is a loose wire that does not connect to anything during normal operation of the XIM™ unit. It is only used when 'flashing' your XIM™ unit when there is an update available. See 'Flashing your XIM™'.

+12V SW:
This wire needs to be connected to a 'switched' power source, or in other words, a power source that is hot whenever the engine is cranking or running. This is the wire the turns the XIM™ on and off.

+BAT:
This wire needs to go directly to your positive post of your vehicle's battery.

-BAT/-BAT(AGND)/-BAT(DGND)/-BAT(PGND):
Any of these that are present in the harness go to the negative post of your vehicle's battery.

BLOCK GND:
This wire is to be connected to a good paint and rust free ground source on the engine block of your vehicle. It is not present in all application.

DRIVER COILS:
This connector plugs into the GM factory coil harness plug on the driver side valve cover. It is only present in the GM LS series XIM™ harness.

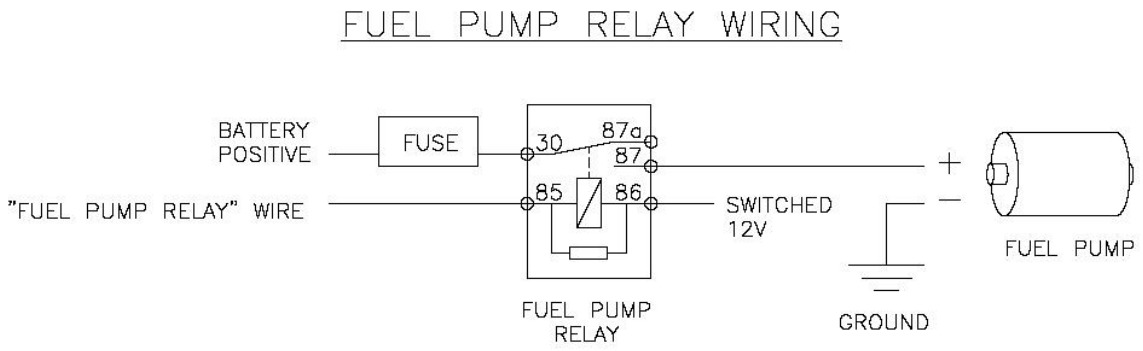
PASSENGER COILS:
This connector plugs into the GM factory coil harness plug on the passenger side valve cover. It is only present in the GM LS series XIM™ harness.

COILS:
This connector plugs into a FAST™ coil harness in some applications. The coil harness then connects to the individual coils. All coil connectors are clearly labeled with cylinder numbers.

CRANK JUMPER:
This jumper connects to the CRANK connector on your FAST™ XFI™ Main Harness. It loops together the unused wires of the ECU's inductive crank input.

TACH OUT:
This loose wire puts out a 12V square wave tach signal to be used as an input into other equipment.

FUEL PUMP RELAY:
This loose wire is a fuel pump relay output. It can be wired to the negative side of a fuel pump relay to control an electric fuel pump. (Do NOT connect it directly to a fuel pump.) The pump will be primed at key-on. And then will run whenever the XIM™ sees an RPM signal. The XFI™ has a similar feature that can also be used for this purpose.



2-STEP / STEP RETARD #1 / STEP RETARD #2:
These loose wires are not used when the XIM™ is being used with an XFI™. Control of special timing features is handled by the XFI™ and its various switched inputs.

MAP:
This connection is not used when the XIM™ is being used with an XFI™. The engine's MAP sensor should be connected to the FAST™ XFI™ Main Harness.

DIP Switch Settings

Your XIM™ unit is configurable for different engine applications. This is accomplished by using 8 DIP switches found inside the back cover of your unit. To access the DIP switches, simply take the lid off by removing the 5 screws, being careful not to tear the gasket beneath the lid. Below you'll find a list of the current engine applications covered with your XIM™ unit and the switch settings that are required for each. The "on" position is marked on the switches.

XIM™ DIP Switches			
DIP Switch (1-4) [0=OFF, 1=ON]	**Ignition Strategy**	**Crank Input**	**"Crank Ref. Angle (ºBTDC)" setting in C-Com XFI™ software**
0 - 0 - 0 - 0	Crank Trigger	1/2/3/4X, 50º BTDC	50
1 - 0 - 0 - 0	OE Crank Trigger	1/2/3/4X, 1-10º BTDC	Actual Crank Position (1-10) + 45
1 - 0 - 1 - 1	Ford Mod, 2 or 4 Valve	36-1 (1 tooth cam)	60
1 - 1 - 0 - 1	Ford Mod, 3 Valve*	36-1 (5 tooth cam)	60
1 - 1 - 0 - 0	Ford Coyote 5.0L**	36-1 (7 tooth cam)	60
1 - 1 - 1 - 1	Chrysler Hemi	36-2-2	50
1 - 1 - 1 - 0	Chrysler Hemi Eagle	60-2	54
0 - 0 - 1 - 1	GM Gen 3 - LS1/LS6	24X (Special)	50
0 - 1 - 1 - 1	GM Gen 4 – LS2/LS7	60-2 (4 pulse cam)	49
0 - 1 - 0 - 1	GM Gen 4 / Gen 3 Cam	60-2 (1 pulse cam)	49
1 - 0 - 0 - 1	24 Pulse Dist. Plug	24X (Even, 1 cam)	50-60

* Ford Mod, 3 Valve uses passenger side cam sensor.
** Ford Coyote 5.0L uses driver side exhaust cam sensor.

DIP Switch (5-6) [0=OFF, 1=ON]	# of Cylinders
0 - 0	2 Cylinder
1 - 0	4 Cylinder
0 - 1	6 Cylinder
1 - 1	8 Cylinder

DIP Switch (7) [0=OFF, 1=ON]	Operation Mode
1	Stand Alone
0	CAN Enabled

"CAN Enabled" allows XIM™ to communicate with XFI™

DIP Switch (8) [0=OFF, 1=ON]	Coil Layout
1	Coil per Cylinder
0	Waste Spark

"Waste Spark" – Each coil fires two companion cylinders simultaneously.

Ignition Strategies

CRANK TRIGGER:
Using a crank trigger with an XIM™ is similar to using a crank trigger with an XFI™. The crank trigger is used to determine engine speed and position. And a separate cam input signal (one pulse every two engine revolutions) is used to locate the start of the firing order. As with an XFI™, the crank trigger should be installed so that the pickup and one of the targets on the crank trigger wheel are lined up with each other when the engine is approximately 50 degrees BTDC.

The number of crank pulses the XIM™ expects to see per revolution (number of targets on crank trigger wheel) is equal to half the number of cylinders. An 8-cylinder engine uses a crank trigger wheel with 4 targets, a 6-cylinder engine uses 3, etc.

The cam signal needs to occur between 10 and 80 degrees before a crank input (which works out to be between 60 and 130 degrees BTDC for a 50 degree crank reference angle). The cam input is typically setup to occur before the crank pulse that corresponds to the first cylinder in the firing order. But other locations are permissible with appropriate coil wiring.

The XIM™ has two sets of outputs for controlling coils – EST and COIL. The type of coil being used determines which set of outputs is needed.

The EST outputs are used with "smart" coils such as those found on GM LS1 engines. These coils have built in coil drivers. They are controlled by a 0-5V square wave. They charge while receiving a 5V signal and fire when the signal drops to 0V.

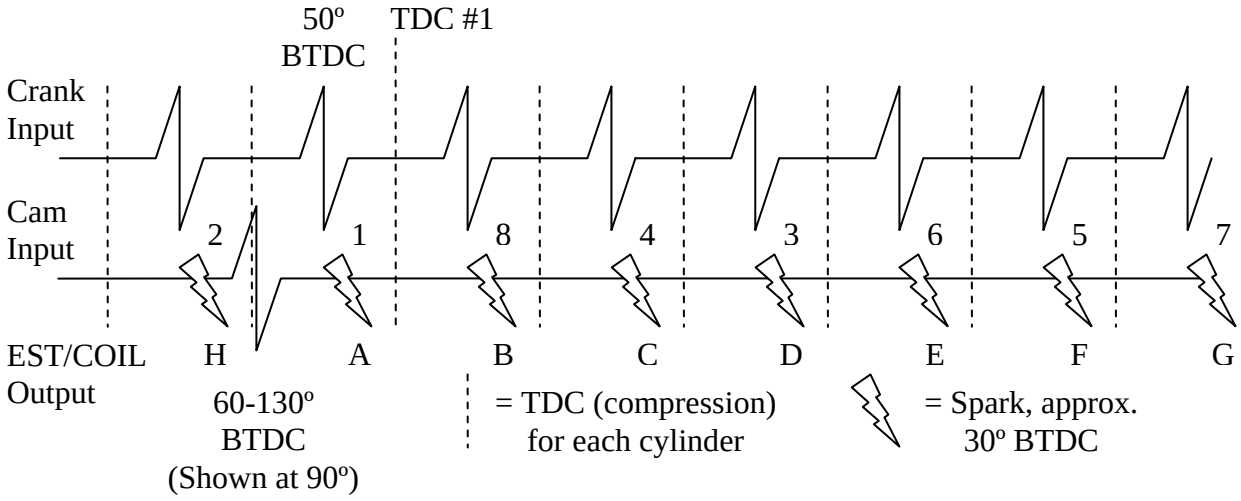
The COIL outputs are used to directly charge traditional (usually 2 pin) coils. Each coil is connected to a COIL output from the XIM™ and to switched ignition power. The COIL outputs are held low to charge the coil and released to fire the coil.

The coil outputs – either EST or COIL – fire one at a time in alphabetical order starting with output A. They need to be wired to each coil according the engine's firing order. EST/COIL output A goes to the cylinder associated with the first crank signal after the cam input (which is typically the first cylinder in the firing order.) The following table shows examples of coil wiring for a small block Chevy with a 1-8-4-3-6-5-7-2 firing order.

XIM™ EST/COIL Wiring (Coil per Cylinder) for Different Cam Signal Locations								
EST/COIL Output	A	B	C	D	E	F	G	H
Sequence after Cam Input	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH
Cylinder # (SBC w/ Cam Before #1 Crank Signal)	1	8	4	3	6	5	7	2
Cylinder # (SBC w/ Cam Before #4 Crank Signal)	4	3	6	5	7	2	1	8

XIM™ – Crank Trigger Ignition Strategy

(One complete engine cycle shown for Small Block Chevy with 1-8-4-3-6-5-7-2 firing order)



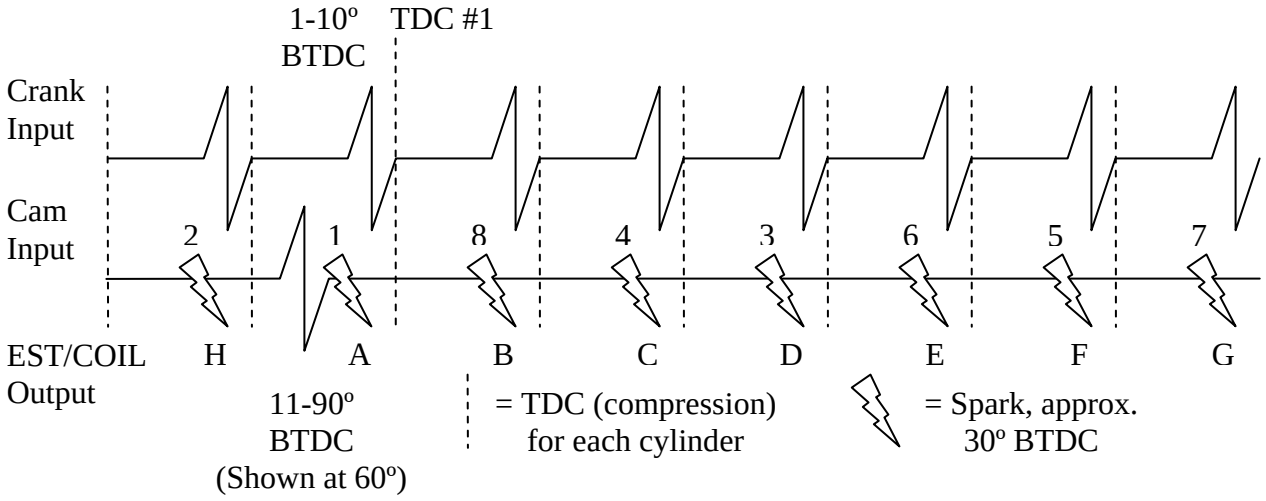
In the case of a "waste spark" setup (one coil for every pair of companion cylinders), the same principle is used to determine where EST/COIL output A will be wired. It goes to the coil that fires the cylinder associated with the first crank signal after the cam input. Unlike a "coil per cylinder" setup, the number of EST/COIL outputs used is only equal to half the number of cylinders. On a "waste spark" V8, the XIM™ fires the first four EST/COIL outputs and then starts back over at A. The sequence is: A–B–C–D–A–B–C–D-…

OE CRANK TRIGGER:

The OE Crank Trigger ignition strategy is designed for crank trigger wheels and pickups whose output (1, 2, 3 or 4 evenly spaced pulses per revolution) occurs just ahead of TDC – as is the case with many older factory ignition systems.

This ignition strategy is the same as the Crank Trigger ignition strategy except that it is intended for use with a crank input between 1 and 10 degrees BTDC. The cam input still needs to occur between 10 and 80 degrees before the crank input. The EST/COIL outputs still fire in alphabetical order starting with output A and EST/COIL output A still goes to the cylinder associated with the first crank signal after the cam input.

XIM™ – OE Crank Trigger Ignition Strategy
(One complete engine cycle shown for Small Block Chevy with 1-8-4-3-6-5-7-2 firing order)



FACTORY SPECIFIC: (Ford Mod, Hemi, LS1, etc.)

Newer factory engines have a variety of complicated trigger wheel arrangements. The XIM™ is pre-programmed to decode these different signal frames. Simply connect the factory crank and cam pickups to the XIM™ and wire the EST/COIL outputs in the engine's firing order. EST/COIL output A goes to cylinder #1.***

XIM™ EST/COIL Wiring for Different Factory Engines								
EST/COIL Output	A	B	C	D	E	F	G	H
Position in Firing Order	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH
Cylinder # (Ford Mod, Waste Spark) - COIL	1&6	3&5	7&4	2&8				
Cylinder # (Ford Mod, Coil per Cylinder) - COIL	1	3	7	2	6	5	4	8
Cylinder # (Ford Coyote 5.0L) – COIL***	6	3	7	2	1	5	4	8
Cylinder # (Chrysler Hemi) - COIL	1	8	4	3	6	5	7	2
Cylinder # (GM LS) - EST	1	8	7	2	6	5	4	3

*** Ford Coyote 5.0L firing order starts at output E.

External LEDs

The XIM™ features four LEDs built into its case. They are a valuable tool for confirming basic functions.

POWER – This LED lights up when the XIM™ is switched on.

CRANK – This LED lights up while the XIM™ is receiving input from the crank sensor. If it is not lit while the engine is turning over, you will need to find out why before the engine will run. Check that the crank sensor is properly installed and plugged in. Also check for any wiring damage between the crank sensor and the XIM™.

CAM – This LED flashes each time the XIM™ receives an input from the cam sensor. It will flash relatively slowly during cranking. The flashing will become more rapid with increasing engine speed. If it is not flashing while the engine is turning over, you will need to find out why before the engine will run. Check that the cam sensor is properly installed and plugged in. Also check for any wiring damage between the cam sensor and the XIM™.

STATUS – In normal operation, this LED lights up when the XIM™ has established CAN communications with the XFI™ ECU. If it is not lit, see the trouble shooting steps outlined above in the CAN LINK discussion.

A flashing status LED indicates one of two possible conditions.

- Flashing briefly once a second indicates DIP switch 7 is not set to OFF to select "CAN Enabled".
- Flashing an even, rapid on/off pattern indicates the XIM™ has started up in flash mode. If flash mode was entered accidentally, make sure the FLASH wire is not touching ground and power cycle the XIM™.

Setting up the C-Com XFI™ Software

Setting up the software in your FAST™ XFI™ to use the XIM™ is very simple. Select "IPU Ignition" as the ignition type. Enter the "Crank Ref. Angle (ºBTDC)" setting shown in the DIP switch table. And finally, if using the Crank Trigger or OE Crank Trigger ignition strategies with the Cam input not occurring before cylinder #1, change the "Cam Sync Precedes Cylinder:" setting. That setting remains "1" for any of the Factory Specific ignition strategies. That's all there is to do. Complete step by step instructions are available under the Help menu in the C-Com XFI™ software under Section 6.0 Initial Setup.

Flashing your XIM™

If it becomes necessary to update the software within the XIM™, the unit will need to be put into flash mode. This is done by grounding the FLASH wire while turning on the XIM™. A rapidly flashing Status LED will indicate that the XIM™ is in flash mode. An update utility will be provided that will send the new software to the XIM™ through the communications cable that links the XIM™ (through the CALPORT connector) to the laptop. Once the update has been sent, remove the FLASH wire from ground and power cycle the XIM™ to complete the flashing process.

XIM™ Pinout Chart					
XIM™ Pin	**Function**	**Wire Color**	**XIM™ Pin**	**Function**	**Wire Color**
30-A1	Inductive Crank Input	Red	**18-A1**	+12V Switched Input	Pink
30-A2	Discrete Crank Input	Yellow	**18-A2**	Retard #2 Input	Purple
30-A3	Crank Output / Tach	Brown/White	**18-A3**	Digital GND	Black/White
30-B1	Digital GND	Black (/White)	**18-B1**	Battery Input	Red
30-B2	Digital GND	Black/White	**18-B2**	Retard #1 Input	Gray
30-B3	Cam Output	Yellow/Black	**18-B3**	Fuel Pump Output	Lt. Green
30-C1	Inductive Cam Input	Red	**18-C1**	Coil Output A	Orange
30-C2	Discrete Cam Input	Brown	**18-C2**	Auxiliary Output****	
30-C3	Flash Enable Input	Blue	**18-C3**	Power GND	Black
30-D1	Digital GND	Black (/White)	**18-D1**	Coil Output D	Purple
30-D2	Digital GND	Black/White	**18-D2**	Coil Output C	Gray
30-D3	Load Input	White/Violet	**18-D3**	Coil Output B	Blue
30-E1	Analog 2 Input****		**18-E1**	Coil Output E	Black
30-E2	5V Reference	Red/White	**18-E2**	Power GND	Black
30-E3	Analog GND	Black/Pink	**18-E3**	Power GND	Black
30-F1	RS-232 RxD	Black	**18-F1**	Coil Output F	Brown
30-F2	RS-232 TxD	Red	**18-F2**	Coil Output G	Yellow
30-F3	Dig GND (RS-232)	White	**18-F3**	Coil Output H	Green
30-G1	CAN_H	Yellow			
30-G2	CAN_L	Green			
30-G3	Digital GND	Black/White			
30-H1	EST Output A	Purple			
30-H2	EST Output B	Purple/White			
30-H3	2-Step Input	Orange			
30-J1	EST Output C	Red			
30-J2	EST Output E	Blue/White			
30-J3	EST Output G	Green/White			
30-K1	EST Output D	Red/White			
30-K2	EST Output F	Green			
30-K3	EST Output H	Blue			

**** Reserved for future use

Notes:
See letters and numbers molded into sides of connectors to find pin locations.

"30-" and "18-" refer to 30 way and 18 way connector.

Limited Warranty

FAST, Inc. warrants that all of its products are free from defects in material and workmanship for a period of 1 year from the date of purchase. This limited warranty shall cover the original purchaser.

FAST, Inc.'s obligation under this warranty is limited to the repair or replacement of its product. To make a warranty claim, the part must be returned within 1 year of purchase to the address listed below, freight prepaid. Items covered under warranty will be returned to you freight collect. It is the responsibility of the installer to ensure that all of the components are correct before installation. We assume no liability for any errors made in tolerances, component selection, or installation.

There is absolutely no warranty on the following:

•**Any parts used in racing applications.**

•**Any product that has been physically altered, improperly installed or maintained.**

•**Any product used in improper applications, abused, or not used in conjunction with the proper parts.**

•**Damage due to excessive manifold pressure, i.e. nitrous backfires, engine misfire, etc.**

There are no implied warranties of merchantability or fitness for a particular purpose. There are no warranties, which extend beyond the description of the face hereof. FAST, Inc. will not be responsible for incidental and consequential damages, property damage or personal injury damages to the extent permitted by law. Where required by law, implied warranties or merchantability and fitness are limited to a term of 1 year from the date of original purchase.

This warranty gives you specific legal rights and you may also have other legal rights, which vary from state to state.