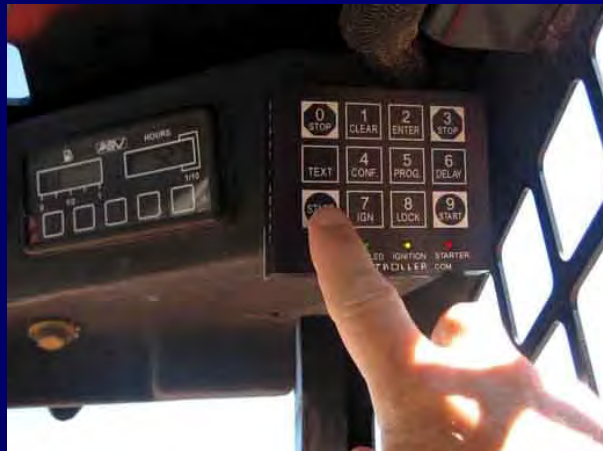


KEYTROLLER, LLC

www.keytroller.com

START-SMART

Programmable keyless ignition system for construction equipment
Piezo sealed metal keypad (SSM) + Duraswitch keypad (SSD)
Designed for tough outdoor construction equipment environments
Duraswitch has RFID card reader option



START-SMART

Equipment application photos



Features:

SSD Duraswitch Keypad

SSM Metal Piezo Keypad



- **NO MORE KEYS!**
 - **START/STOP** directly from keypad
 - Never leave or forget your keys again!
- **Keeps untrained—unauthorized people from starting the vehicle**
 - Must have code to start engine
 - Codes/cards easily changed (deleted or added) by owner from keypad or PC
- **Can be wired as an anti-theft device using our wireless relay hidden in ignition, starter or fuel pump circuit**
 - Anti theft wireless relay prevents “hot wiring” of engine
- **Keeps event log of usage by operator or vehicle**
 - Start—stop time recorded
 - Usage (hour meter) recorded
 - Can be filtered by operator or vehicle



Models

- **SSD-215** code only enabled Sealed Duraswitch blue magnetic keypad - start/stop from keypad---eliminating keys (includes wired relay module). Designed and sealed IP67 for outdoor and abusive applications. Manually programmable from keypad or through USB connection to PC software. Includes USB for PC interface for programming users and downloading of event log usage events
- **SSM-215** code only enabled Sealed metal piezo keypad - start/stop from keypad---eliminating keys (includes wired relay module). Designed and sealed IP67 for outdoor and abusive applications. Manually programmable from keypad or through USB connection to PC software. Includes USB for PC interface for programming users and downloading of event log usage events
- **SSD-HRFID-215** code or HID-RFID card enabled Sealed Duraswitch keypad - start/stop from keypad---eliminating keys (includes wired relay module). Designed and sealed IP67 for outdoor and abusive applications. Manually programmable from keypad or through USB connection to PC software. Includes USB for PC interface for programming users and downloading of event log usage events



Applications:

- Construction Equipment
- Forklifts
- Cranes
- Aerial Lifts
- Utility Vehicles
- Golf Carts
- Compressors
- Generators
- Pumps
- Welders



Components :

- 1) Metal Piezo keypad (SSM model)
- 1) Duraswitch keypad (SSD model)
- 1) Duraswitch RFID (SSD-HRFID model)



- Potted to protect PCB and microprocessor from corrosion and weather extremes
- USB connector for connection to PC or radio

- 2) Dual potted relay module
Connected to:
 - ignition key (3 wires for IC)
 - ignition key (2 wires for EL)
 - power from vehicle (2 wires to 12VDC)

- 4) Voltage converter
(for 24—48VDC vehicles *only*)

- 5) Plug in transformer
(used as power supply *only* for tabletop demo)

Why a piezo or duraswitch keypad?

- Electronic -- has NO moving parts like mechanical switch keypad
- Designed for the toughest environments and sealed for outdoor marine exposure and usage
- Potted internally to protect PCB from moisture and corrosion IP-67
- Anodized graphics that will not wear off
- Weatherproof, dust proof, tamper proof, vandal proof and waterproof. IP-67 rated enclosure
- Durable, reliable --- virtually indestructible.
 - Electric life: 50,000,000 cycles minimum!
- Tested for high reliability
 - High Temperature reliability
 - Low Temperature reliability
 - High to Low Temp "Thermal shock" test
 - Overvoltage test
 - Vibration test
 - Water intrusion, condensation test
 - Salt spray test

Doing a tabletop demo:



1. Connect the keypad box to the dual relay unit using the connector at the end of the gray cable with the red sleeve.
2. Connect 12V positive from the plug in transformer (white stripe) to the green wire from the relay box, and 12V negative (solid black) to the brown wire at the relay.
- 3) Plug in the power supply into 110VAC outlet
- 4) Enter default (programmers) code
- - - - (see manual or call factory)
to start
- 5) Both TEXT and ENABLED green LEDs light showing code accepted

Single finger start (Default)

Changing from single to two finger start---
programmed at keypad



- For safety reasons (particularly in a boat) you may want to enable 2 finger start. This requires 2 fingers pressed at the same time on both START buttons. This will prevent a child from “playing” with the keypad and inadvertently starting engine.

■ Programming 1 or 2 finger start

1. Login using a programmer code. ENABLED and TEXT LEDs will go on.
2. Press PROG. button.
3. Press left START button to disable two finger start (it will be 1 finger start from either side); press right START button to enable two finger start.

Dual finger start

This helps to prevent “child” from accidentally pressing START button while device is enable.

(Default is single finger start—from either START button)

- 1) Driver enters his 4 digit code into keypad
- 2) Both TEXT and ENABLED LEDs light showing code was accepted
- 3) Press BOTH START keys at same time to start engine. Remove when engine is running directly from keypad
- If set to 1 finger start---engine will start by pressing either left or right START button



Programming in/out user codes

Set from keypad using programmer's code/card or through PC software



Code	Name	Type	Expiration Date
0001	Joe Flon	U	8/31/2008
0034	Jose Aviles	U	8/31/2008
0062	Joe Torres	U	8/31/2008
0074	Pedro Alamo	U	3/31/2009
0085	Don Leslie	U	8/31/2008
0145	Charla Koy	U	8/31/2008
0215	Ron Marshia	U	5/31/2009
0286	Roland Frechette	U	11/30/2008
0397	Curtis Boissonneault	U	
0543	Roger Masson	U	8/31/2008
0583	Dennis Cote	U	8/31/2008
0627	Paul Austras	U	
0761	Dy Nhar	U	8/31/2008
0795	Ang Ceun	U	7/31/2009
0865	Leo Homel	S	
0927	Paul Boissonneault	U	
1004	Robinson Garcia	U	10/31/2008
1010	Fred Penney	U	9/30/2008
1011	Stephen Day	U	7/31/2010
1090	Jim Kane	U	8/31/2008
1123	Jay Loukes	S	6/13/2008
1124	Robert Sigman	U	8/31/2008
1126	Pete Campbell	U	8/31/2008
1210	Mike Cornelius	U	12/31/2008
1223	Nino Sanchez	U	8/31/2008
1228	Fred Boucher	U	8/31/2008

- Use programmer's code/card to manually input or take out codes/cards directly from keypad
- Use laptop or PC to input or take out codes/cards connecting USB to PC or radio and then using drivers database in software
- When using software you can also add expiration dates (date when recurrent training or rental period expires)



Recurrent training status is automated through code/card expiration

The screenshot displays the 'Users Setup - KISS Soft v1.13.2' application. The main window shows a 'Users Database' table with columns: Write, Card ID/E, Staff ID, Operator's Name, Operator's Class, Operators Type, Department, Expiration Date, and Operators/RFID card Code. A 'Users Filters and Options' panel is visible on the right. A 'Users to Expire' dialog box is open, showing a list of users with their operator codes, names, and expiration dates. The dialog includes a legend for expiration status: a red 'X' for 'Operator code has expired!', a yellow 'W' for 'Will expire with in 1 week', a red '1' for 'Will expire with in 1 month', a yellow '2' for 'Will expire with in 2 months', and a green '3' for 'Will expire with in 3 months'. The dialog also has buttons for 'Filter Data', 'Reset Filter', 'Add New User', 'Show Expired Users', 'Classes and Depts.', 'Close', and 'Save and Close'.

Operator's Code	Operator's Name	Expiration Date
F026DE	Carl Williams	9/25/2008
3A07B7	Carl Davis	10/11/2008
3A06D2	---	3/4/2009
3B054C	Mathew Sutherland	3/6/2009
1234	Joe Blow	3/31/2009
3A05A9	Pitt Smith	3/31/2009
3A05A8	Henry Rodriguez	3/31/2009
3A05A4	Ron Harris	3/31/2009
3A06EC	---	3/31/2009
80E24D	Gillian Combos	4/2/2009
E24D	Bret Gribus	4/3/2009
3A06A3	Andy Wickman	4/4/2009
3A05A7	Rick Uhl	4/30/2009
3A05A6	John Smith	4/30/2009
3A05A5	Dick Harry	5/28/2009
3A05A3	Richard Little	5/30/2009

Code expiration “red flags” management that recurrent training is due for that operator OSHA regulation 1910.178(l)(4)(i) *Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by paragraph (l)(4)(ii) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.*

Types of users



- **Programmer Full functionality**
 - Can program in/out (4 digit codes or RFID)
 - Operators, Supervisors, Other programmers
 - Can lock out operators
 - Can unlock operators again
 - Can change auto logout (time out) time
 - Can initiate delay logout (time out) time
 - Can **START/STOP** the vehicle

- **Supervisor Limited functionality**
 - Can lock out operators
 - Can unlock operators again
 - Can change auto logout (time out) time
 - Can initiate delay logout (time out) time
 - Can **START/STOP** the vehicle

- **Operator Restricted functionality**
 - Can ***only*** **START/STOP** the vehicle
 - Can initiate delay logout (time out) time

Evaluating Event Log Data

Keysoft V3.10

Wireless

KEYROLLER, LLC.

Use the options below to connect to the Keyroller: Vehicle ID: N/A Keyroller Serial Status: CLONE FILE EDIT

Communication Motion Databases Programmer Clone Checklist

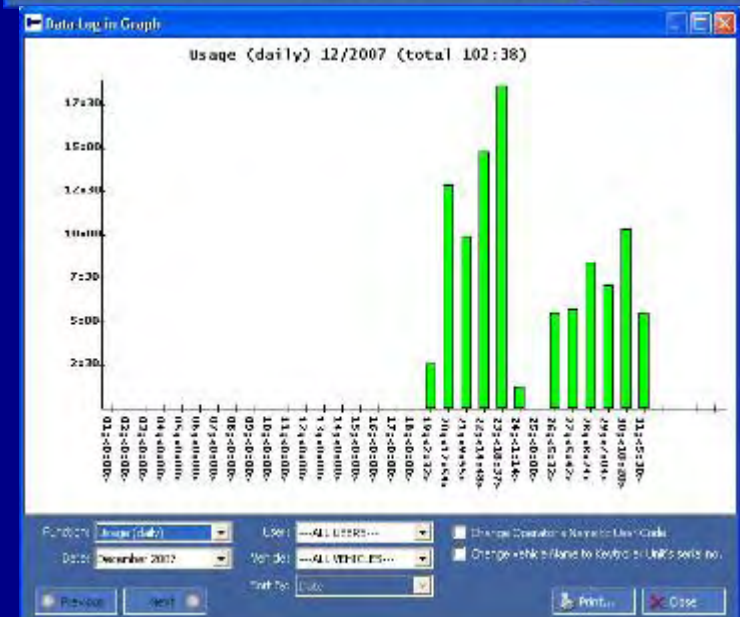
Event Log Vehicles

Users Graph

Back Exit

Event logs can be filtered by time, date, operator, vehicle, event and deleted or exported to Access or Excel for further manipulation

Date	Time	Event	Name	VehicleID	Serial#
11/17/2008	11:16:32 AM	Ignition On	Parts Room Toyota	01354E	
11/17/2008	11:01:29 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:00:19 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:59:03 AM	Starter On	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:58:50 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:58:40 AM	Ignition Off	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:58:27 AM	Starter On	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:58:08 AM	Log on	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:57:44 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:46:36 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:45:19 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:43:45 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:42:44 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:42:16 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:41:23 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:40:54 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:40:13 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:39:39 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:38:18 AM	Starter On	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:36:47 AM	Log on	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:35:19 AM	Auto Ignition	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:31:18 AM	Ignition Off	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:30:10 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:31:40 AM	Starter On	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:31:40 AM	Log on	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:31:25 AM	Log L-1 Powerup	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:19:13 AM	Ignition Off	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:13:57 AM	Starter On	Undefined in DB	Parts Room Toyota	01354E
11/17/2008	11:13:57 AM	Log on	Undefined in DB	Parts Room Toyota	01354E



Auto log off (default=1 min)

Set from keypad using programmer's code/card or through PC software

Changing auto logout time

(time device times out after STOP is pressed)

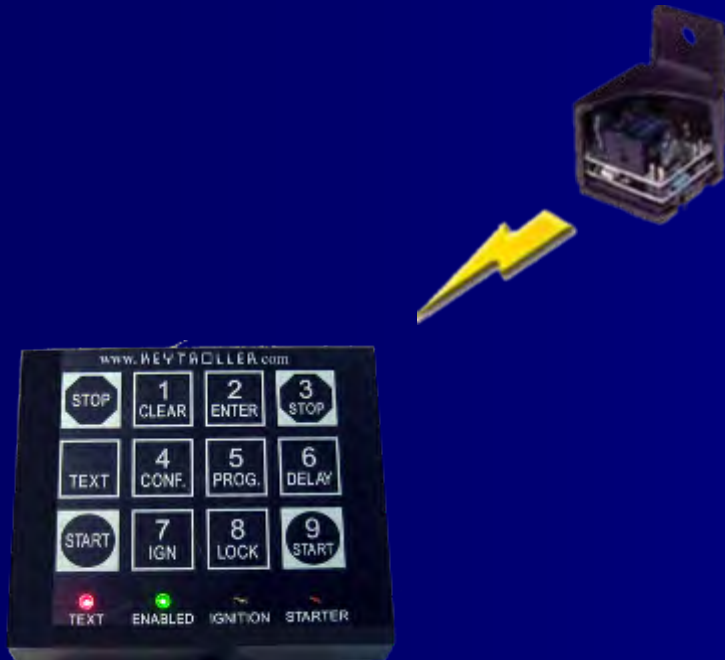
Factory default set to 1 minute!

1. Log in to the unit with a programmer code.
2. Press **ENTER** button. IGNITION + START LEDs will start flashing.
3. Enter the desired time out by pressing one of the numbers: " 1 " for one minute, " 2 " for two minutes, etc. Pressing button " 0 " will set the logout time to eight 8 seconds, NOT zero (0) seconds.
4. **START-SMART** will flash quickly
ENABLED + START LEDs



With anti-theft wireless relay (optional)

Note: Units MUST be ordered with wireless relay option. Standard units have wired dual relay module only



- 1) Enter good 4 digit code
- 2) Both TEXT and ENABLED LEDs light showing code accepted
- 3) As soon as code is *accepted—transmitter in keypad enables wireless relay hidden in starter, ignition or fuel pump circuit*
- 4) Once wireless relay has enabled the circuit, press START to engage ignition and starter wired relays to start engine

Why a wireless relay? If the hidden wireless relay is NOT enabled by the keypad the circuit it is in is NOT enabled---preventing a “hot wire” start by a thief.
(wireless relay hidden in starter, ignition or fuel pump circuit)

Locking operators out



- Sometimes a programmer or supervisor may want to prevent even authorized operators codes from starting the vehicle (perhaps for the weekend or because of a mechanical problem for example)

- Lock out procedure:

1. Enter Programmer's code
2. Press PROG button

* Ignition LED flashes indicating all operators locked out

NOTE!! (Supervisor and programmers codes all still work—you can ONLY lock out an operator's code)

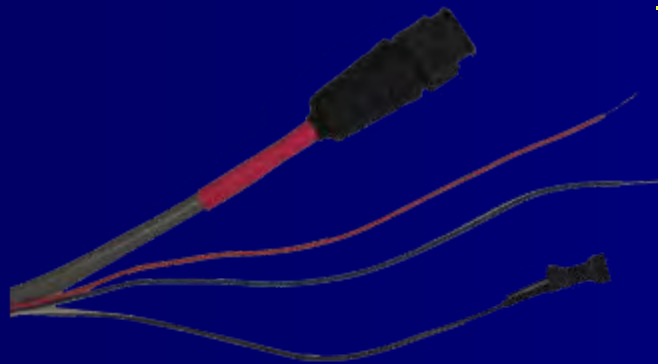


- Unlock procedure:

1. Enter any programmer's or supervisor's code. Device immediately re-enables all previous operator codes existing before lock out

Auxiliary connection

Protects from engine failure



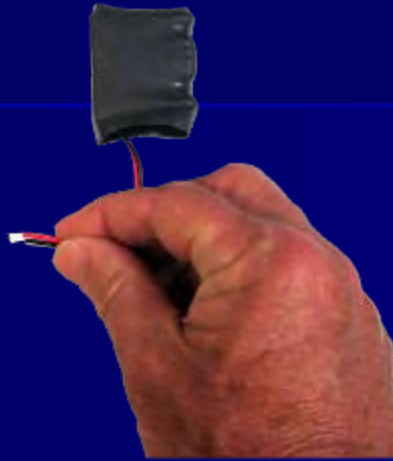
- 2 Wires--Located at connection from keypad to relay
- Can be used for:
Connection to low oil pressure or high temp dash light

When dash light goes "high" auto log off will begin---protecting engine from catastrophic failure., if light goes out during log off, will reset. After engine shut down---will allow operator to re-start.

Note: Auto log off can be set by programmer at the keypad.
Set in minutes (0—99)
Instantly (0) will actually be 8 seconds
Default setting is 1 minute

- Auxiliary connection is enabled at the keypad OR from PC software by the programmer.
- Default has auxiliary connection disabled !

"Super Cap" option



- START-SMART is a microprocessor controlled device.
- If your battery and/or alternator is decayed and battery voltage drops very low (under 7 volts) as starter is engaged--the microprocessor can "drop out"---preventing the engine from starting.
- "Super Cap" is a capacitor that stores energy providing continuous 12VDC power to the microprocessor even though supply voltage may drop low.
- This option is easy to install, just open the keypad up and plug in the "Super Cap" at the connector provided.
- "Super Cap" is only necessary on a low percentage of vehicles but it is a "safe" option to have if you have a suspect battery or charging system.



Easy Installation

1. **Mount Keypad to dash**
 2. **Connect Keypad to dual potted relay module**
 - Center gray cable in picture
 3. **Relay module wires connected to:**
 - (3 wires on IC vehicle---top 3 in relay picture)
at ignition keyswitch
 - (2 wires on EL vehicle---top 2 in relay picture)
at ignition keyswitch
- + power from vehicle (12 or 24VDC)
- (2 wires --- bottom two in relay picture)
 - Add in line voltage converter for EL vehicle (HVC 36—48VDC)



START-SMART

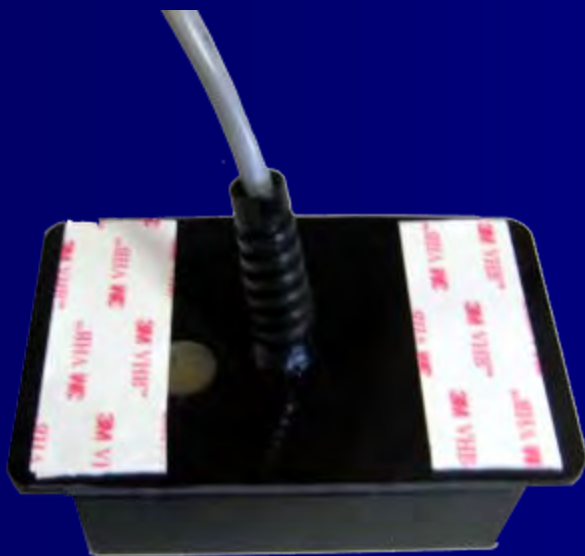
Install options to dash— using mounting studs



1. Take template and mark holes where you want to mount the keypad
2. Drill (4) $\frac{1}{4}$ " holes on each corner for studs and 1" in center for cable
3. Screw in studs into keypad corners (it is recommended you secure these with superglue or locktite)
4. Mount keypad over holes, insert center cable into center hole.
5. Push keypad and corner studs into their holes
6. Connect studs under dash with lock washer and nuts to secure keypad in place on dash

START-SMART

Install options to dash—using double sided tape



- Use outdoor rated 3M VBM double sided tape—built up on back of the device.
- Be sure mounting area is completely clean and free of water, dirt and grease
- Stick device to mounting area making sure it is square.
- If possible –put heavy weight on the device for several hours to create pressure while it cures in place
- Complete curing takes several days so be sure not to move or “play” with the keypad until the tape is completely cured in place

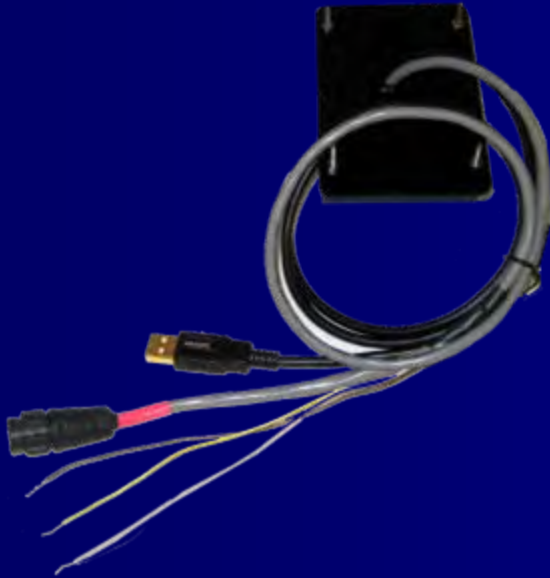
START-SMART

Install options to dash—using holes on mounting bracket



1. Drill $\frac{3}{4}$ " hole in dash for cable insert center cable into center hole
2. Drill (4 or 6) $\frac{1}{4}$ " holes on each corner (and center) for screw insert (Note: screws are supplied by installer)
3. Center keypad over holes and insert screws.
4. Screw in screws into keypad corners (it is recommended you secure these with superglue or locktite)

Advanced **START-SMART** model with event logging



START-SMART with USB port

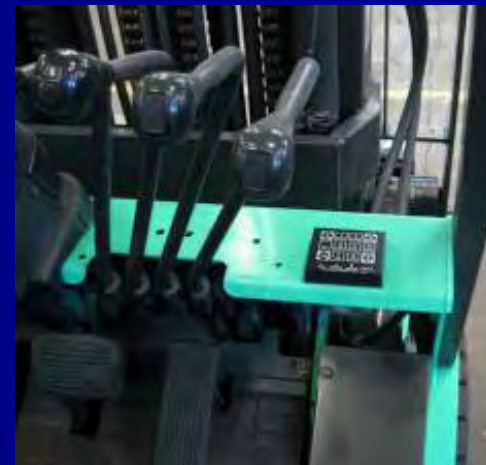
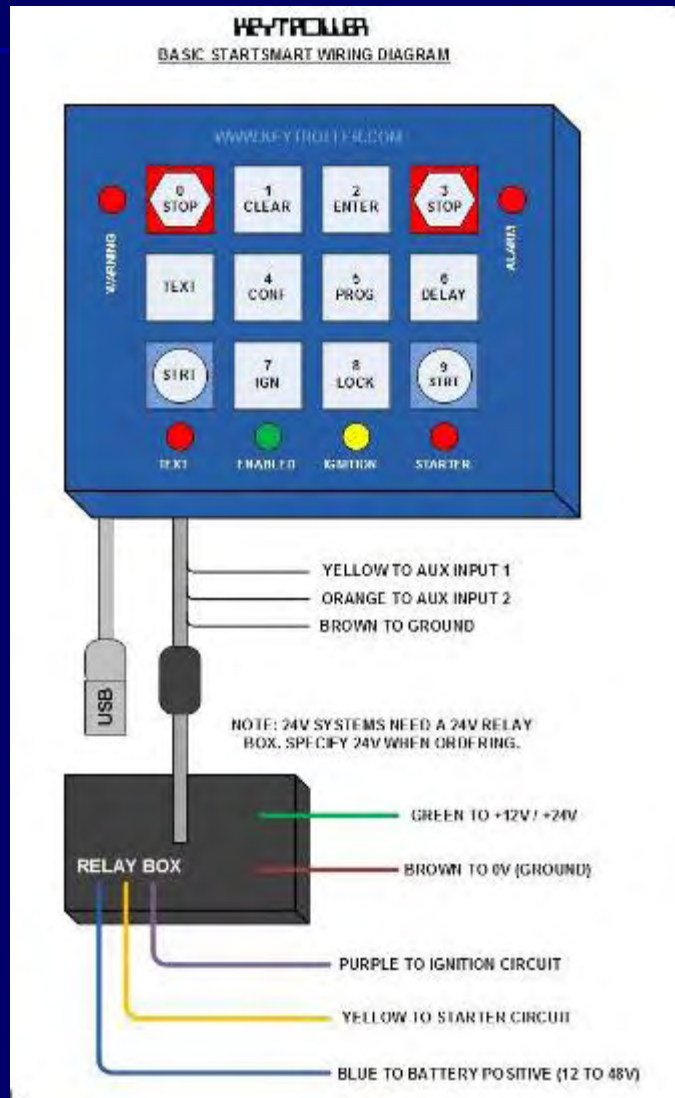
Standard features:

- 1. PC programming and downloading using **KEYSOFT**
- 2. Logging—time/date/operator/vehicle for every event
- 3. Internal hour meter
- 4. Code or card expiration—helps schedule training
- 5. Aux inputs for: Seat switch, seat belt, overload, high temp, low oil pressure (choose 2)
- 6. RFID card reader option
- 7. Communication options **USB port**
 - **CYBERWIRE** Wireless transmission
 - 2.4ghzr Zigbee
 - 802.11 WiFi
 - Bluetooth
 - Direct connection with laptop or PC

START-SMART

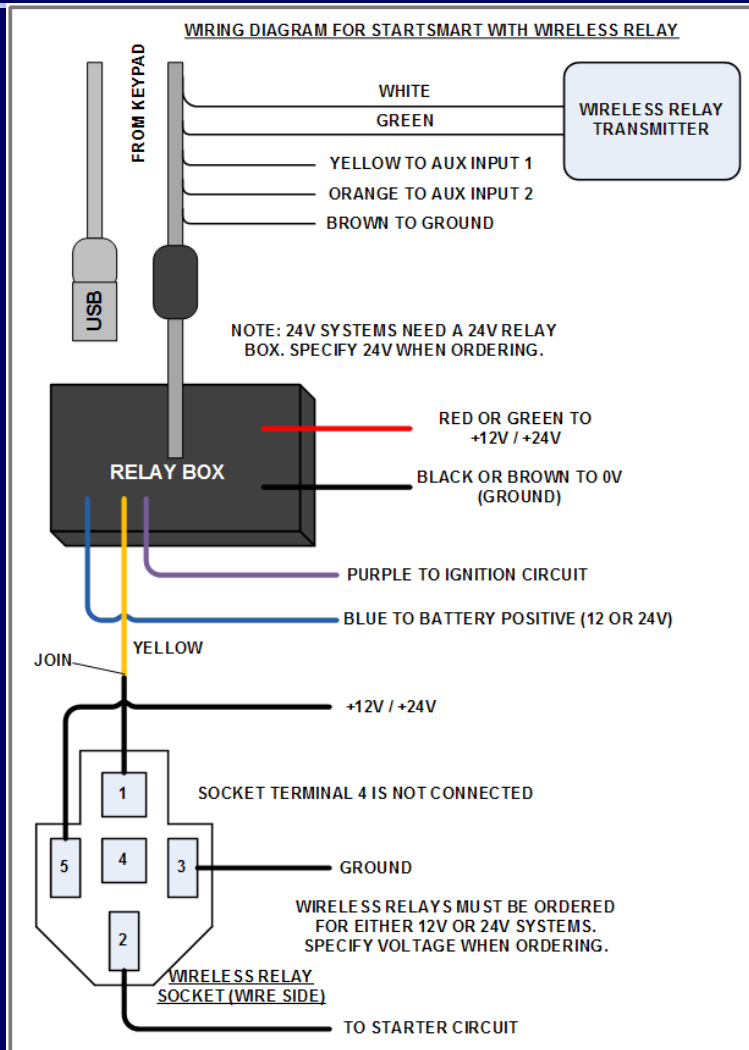
Installation schematic

With Wired relay only



START-SMART

Installation schematic With Wired + Wireless relay



- When ordered with the wireless relay anti-theft option.
- Device wirelessly enables hidden relay after a valid code/card is accepted.
- When wireless relay is enabled, driver uses keypad to start/stop engine

Quick reference guide

Two finger START (default is one finger start)

For safety reasons (particularly in a boat) you may want to enable 2 finger start. This requires 2 fingers pressed at the same time on both **START** buttons. This will prevent a child from "playing" with the keypad and inadvertently starting engine.

1. Log in using a programmer code. **ENABLED** and **TEXT LEDS** will go on.
2. Press **PROG.** button.
3. Press left **START** button to disable it; press right **START** button to enable it.

Enabling/Disabling the auxiliary input (default is disabled)

1. Log in using a programmer code. **ENABLED** and **TEXT LEDS** will go on.
 2. Press **ENTER** button. **START LED** light will start flashing.
 3. Press left **START** button to enable it; Press left **STOP** button to disable it.
- Note: Unit will timeout in (1 minute) when voltage is applied to an enabled auxiliary input (like low oil pressure or hi engine temp dash lights)

Changing auto logout time (default is 1 minute):

1. Log in to the unit with a programmer code.
2. Press **STOP** button. **IGNITION + START LEDS** will start flashing.
3. Enter the desired time out: **[0]** for one minute, **[2]** for two minutes, etc. The **ENABLED + STARTER LEDS** will flash quickly → timeout has been changed. Note pressing **[0]** sets logout time to eight (8) seconds, NOT zero (0) seconds.

Logout Time Delay (for users that want to temporarily set a longer keypad off delay—like fishermen who want to immediately start the engine)

1. Log in to the unit.
2. Press **DELAY** button. **IGNITION + START LEDS** will start flashing.
3. Enter the desired time out: **[1]** for one min, **[2]** for two min, up to **[99]** mins. **ENABLED + STARTER LEDS** will flash quickly → timeout has been "delayed" or temporarily changed—after this temporary delay, it will revert back to the set auto logout time (default is 1 minute). Note pressing **[0]** sets logout time to eight (8) seconds, NOT zero (0) seconds. If you have lots of time left on the temp delay and need to shut it off, you can shut the device off **IMMEDIATELY** by: pressing **TEXT** then re-entering any good code

PROGRAMMING CODE:

Refer to your manual for the default programming code. It is recommended you change this and enter several new programming codes and keep them in a safe place to refer to later if they are forgotten.

Product Support:

Call between 8:30—5:00PM EST M-F or email questions

KEYTROLLER, LLC.

3907 W. Martin Luther King Blvd. Tampa, FL USA 33614
Ph: 813-877-4500 Fax: 813-871-6250 sales@keytroller.com
www.KEYTROLLER.com

START-SMART M (small profile keypad ignition) (v1.1)

QUICK REFERENCE GUIDE—KEYPAD PROGRAMMING

TEXT LED - ON → word on key used TOGGLE TEXT LED on/off by pressing **TEXT**

TEXT LED - OFF → numbers used TEXT LED → OFF before entering code!
Every good button press will have TEXT LED light for a moment

Getting Started:

- All keypads have default start code of **1-2-3-4** (this is NOT prog's code)
- Input this code → **TEXT + ENABLED** light—showing code acceptance
- Press **START** + hold down until started—Press **STOP** button to stop
- Device remains enabled for 1 minute after stop (default) and then off
- Vehicle can be restarted anytime within this auto logout time

Programming in user codes —Default programmer's code is in manual

1. Enter programming code. → **TEXT + ENABLED LEDS** will go on.
 2. Press **CORF** button. → **IGNITION LED** flashes.
 3. Enter new user code. → **TEXT + IGNITION + WARNING LEDS** flash 3 times, then **IGNITION + START LEDS** will continue flashing.
 4. Select Operator Type: Press **[1]** — Operator, **[2]** — Super'r **[3]** — Program'r
 5. **ENABLED - IGNITION LEDS** will flash 3 times.
 6. For multiple code inputs, now repeat steps 2—5 for up to 1000 codes
- Note: You can input as many programmer codes as you want—you can ONLY program in other codes using a programmer's code—refer to manual for default programmer's code. Call factory for reset procedure

IMPORTANT!!!!!! Upon receipt of device, owner should IMMEDIATELY program in new codes + TAKE OUT 1-2-3-4 as a useable code using default programmer's code in manual; you should also change default programmer's code for security. All **START-SMART M** (small profile) units come with same default codes to facilitate shipping. **for security you should remove these 2 pre-set codes NOW, an input new ones!!**

Deleting user codes

1. Enter programming code, **ENABLED** and **TEXT LEDS** will go on.
2. Press **CLEAR** button. **IGN LED** flashes.
3. Enter user code to be removed: **TEXT + IGN + WARN LEDS** flash 4 times
4. then **ENABLED - IGN LEDS** will flash 3 times.

Locking out the device (locks out good operator codes)

1. Log in with a prog's or super's code. **ENABLED** and **TEXT LEDS** will go on.
2. Press **LOCK** button. Unit will logout + **IGNITION LED** flashes every 2 seconds.

Unlocking the device:

Input any programmer's or supervisor's code, this will immediately unlock users

Every SSM Start-Smart Device comes with a laminated programming guide

Provides easy and weatherproof guide to programming and operation of the device

START-SMART

Model SSO box style

- SSO model has the same features as smaller SSM model but designed into a dash-top box with mounting ears on each side
- Has one cable exposed out the top of box
- Less expensive



KEYTROLLER, LLC

The Company



- Full line of award winning equipment safety devices for:
 - Access--- monitoring--- GPS locating--- speed and abuse control--- training--- anti theft--- weighing
- Over 500 equipment dealers in N. America for local representation and support
- International distribution in Europe, S. America, Asia and Australia
- OEM installation of devices available
- Over 20,000 devices installed in the field
- All models designed to install on any make or model----
gas, diesel or electric powered vehicles
- Keytroller devices designed and supported in house
- Manufactured and/or distributed from Tampa, Florida USA

www.keytroller.com

813-877-4500

info@keytroller.com