

GSE One User's Guide

s/w 1.3

Standard Features:

Solenoid drivers for Fill, Dump and Oxygen valves.

High current igniter output for fuse head igniters or high voltage unit (8 Amps Max.).

Continuity detection when oxygen enable toggle switch is off.

Temperature sensing of vent while filling.

Audio in/out for microphone at the pad and headphones at the LCO.

Sonic alert on the Igniter output for safety.

System LED:

Fast blinking (ten per second) indicates the communication link between the LCO and Pad modules is not solid in both directions. Check the cable.

A slow blinking (once per second) indicates the unit is ready.

A double blink when in setup mode.

Lighting a composite motor:

At the pad connect the igniter to the Igniter output.

Set the Oxygen switch to the off position so the Status LED will show continuity, a fast blink indicates continuity while off indicates no continuity.

Switch the Fire Enable key switch to the on position (CW 90 degrees).

Press the Fire button and hold it down for about one half second.

Switch the Fire Enable key switch to the off position (CCW 90 degrees).

Lighting a hybrid with pyro-ignition:

At the pad connect the igniter to the Igniter output, the Fill valve to the Fill output and the Dump valve to the Dump output.

Sit the microphone on the ground so it is "line of sight" with the vent.

Tape the temperature sensor cable to the rocket or pad and position the sensor in front of the vent.

Set the Oxygen switch to the off position so the Status LED will show continuity, a fast blink indicates continuity while off indicates no continuity.

Switch the Fill toggle on, listen for the fill to complete and watch the Status LED. The Status LED will come on solid when the temperature sensor is spayed with liquid N₂O.

When the fill is complete return the Fill toggle to the off position.

Switch the Fire Enable key switch to the on position (CW 90 degrees).

Press the Fire button and hold it down for about one half second.

Switch the Fire Enable key switch to the off position (CCW 90 degrees).

Lighting a hybrid with O₂-HV ignition:

At the pad connect the high voltage unit to the Igniter output, the Fill valve to the Fill output, the Dump valve to the Dump output and the Oxygen valve to the Oxygen output.

Sit the microphone on the ground so it is "line of sight" with the vent.

Tape the temperature sensor cable to the rocket or pad and position the sensor in front of the vent.

Set the Oxygen switch to the ON position.

Switch the Fill toggle on, listen for the fill to complete and watch the Status LED. The Status LED will come on solid when the temperature sensor is spayed with liquid N₂O.

When the fill is complete return the Fill toggle to the off position.

Switch the Fire Enable key switch to the on position (CW 90 degrees).

Press the Fire button and hold it down until the motor is burning. (usually 3 to 5 seconds)

Switch the Fire Enable key switch to the off position (CCW 90 degrees).

Technical Details:

Fire Without Oxygen: the Fire button has a one third second delay, for switch de-bounce and signal confirmation, then the Igniter circuit is energized for one second to ten seconds, settable as parameter two.

Fire With Oxygen: the Fire button has a one third second delay, for switch de-bounce and signal confirmation, then the oxygen output is energized. Two tenths of a second later the Igniter circuit is energized for up to 10 seconds (see parameter setup) while the Fire button is held down. The Oxygen will stay on until the Fire button is released.

System LED indicates power and data link status.

Status LED shows continuity when oxygen enable if off, fill vent temperature while filling, and flashes to acknowledge dump and fire commands.

Fill switch safety: if the fill switch is on when the unit is powered up the fill valve will NOT activate until the switch is turned off the back on. Pressing the Fire button or the Dump button while filling stops the fill and does nothing.

Fuse: Use only 15 Amp. fast blow fuses.

Schematics and Firmware: source code and drawings are available on request to registered owners.

Parameter setup:

- 1) Unplug all valves, the igniter and auxiliary connectors.
- 2) Start with Oxygen and Fill switches in the Off position, the System LED should be blinking a slow single blink indicating a good communications link, and the Status LED should be off indicating no continuity.
- 3a) Press and hold the Fire button.
- 3b) Press and hold the Dump button.
- 3c) Cycle the O2 enable switch On then Off again.
- 3d) Release the Fire and Dump buttons. The System LED should now be double blinking to indicate the unit is in setup mode and the Status LED single blinking to indicate parameter 1 is selected.

Parameter 0: (no flash of status LED) Press the Dump button to restore all factory defaults.

Parameter 1: Is the Igniter time when Oxygen is enabled. The range is 1 to 10 seconds.

Press and Hold the Dump button for the desired time.

Parameter 2: Is the Igniter time when Oxygen is Disabled. The range is 1 to 10 seconds.

Press and Hold the Dump button for the desired time.

Parameter 3: Enable/Disable Oxygen Lead. Press the Dump button to change.

To Review time parameters: turn the Fill switch On, the Status LED will fast blink for the time set. Return the Fill switch to the Off position.

To Review Boolean parameters: turn the Fill switch On, the Status LED will blink slow for 0 (OFF) and fast for 1 (ON).

To exit setup mode cycle the Oxygen switch.

To advance to the next parameter press the Fire button.

Deluxe Options:

By request and for an additional charge the Deluxe GSE One can be upgraded to:

- 1) Echo pulses from a flow meter "Signet" or other pulse generating equipment.
- 2) Load Cell to Servo or Frequency output for weight of N2O tank. An automotive tachometer can be used as an output.

Other options can be done build to order, let me know what you would like to add.

DMF-Rockets.com

For technical help call or email Dave (626) 893-6654 dflynn@oxfordvue.com

www.blkdgrkty.com

For sales and accessories call or email Ron McGough : Cell #562-755-1054 rrmagoo@blkdgrkty.com

Connectors:

Communications Connector (Pad Module)

Pin 1	J1-1	+12 volts
Pin 2	J1-2	Ground
Pin 3	J1-3	RS-422 Receive +
Pin 4	J1-4	RS-422 Receive -
Pin 5	J1-5	RS-422 Transmit +
Pin 6	J1-6	RS-422 Transmit -
Pin 7	J1-7	Audio Out
Pin 8	J1-8	Ground

Temperature / Microphone Connector (Pad Module)

Pin 1	J9-1	Audio In
Pin 2	J9-2	Ground
Pin 3	J10-1	Temperature In
Pin 4	J10-2	Ground

Aux In Connector (Deluxe Version Only) (Pad Module)

Pin 1	J13-1	TTL Input 10K Ohm pull-up
Pin 2	J13-2	Ground
Pin 3	J2-2	RA2 Pulse Counter Input 47K Ohm pull-up (Optional)
Pin 4	J3-2	RA3/ AN3 Scale/ Load-Cell Analog Input (Optional)

Aux Out Connector (Deluxe Version Only) (Pad Module)

Pin 1	J11-1	Battery +
Pin 2	J11-2	Aux Out 1 (Open Drain 3 Amps Max.)
Pin 3	J12-1	Battery +
Pin 4	J12-2	Aux Out 2 (Open Drain 3 Amps Max.)

Communications Connector (LCO Module)

Pin 1	J1-1	+12 volts
Pin 2	J1-2	Ground
Pin 3	J1-3	RS-422 Transmit +
Pin 4	J1-4	RS-422 Transmit -
Pin 5	J1-5	RS-422 Receive +
Pin 6	J1-6	RS-422 Receive -
Pin 7	J1-7	Audio In
Pin 8	J1-8	Audio Ground

Data Connector (LCO Module) (Super Deluxe Version)

Pin 1	Ground
Pin 2	PWM Output (Servo or Tachometer)
Pin 3	+5 Volts (40mA Cont. 200mA Max.)
Pin 4	RB4 TTL Output (Pulse Counter)

Connector Parts:

<u>Description</u>	<u>Mfg P/N</u>	<u>Digikey</u>
AMP 17/16-11 Flange Conn	206043-1	A1362
AMP 17/16-11 Plug	206044-1	A1358
AMP 11/16-4 Flange Conn	206430-1	A1360
AMP 11/16-4 Plug	206429-1	A1357
AMP 17/16 Back Shell	206070-1	A1332
AMP 11/16 Back Shell	206062-1	A1330
AMP 17/16 dust cover	207445-1	A16040
AMP 11/16 dust cover	206903-1	A16038
AMP Sockets	66105-4	A1343
AMP Pins	66103-4	A1342

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; Configuration for GSE One Firmware
;
; PIC16F628 Standard
kSerialNumber          EQU          d'108'
;
; w/ oxygen enabled
;
kPWMDutyCycleIndex     EQU          0x03          ;0..3, 3%,5%,7%,10%
kDefaultIgniterTime    EQU          d'1000'       ;10 seconds 100ths of a second
kMaxIgniterTime        EQU          d'1000'       ;10 seconds
kMinIgniterTime        EQU          d'100'        ; 1 second
;
kDefaultNoOIgniterTime EQU          d'100'        ;1 second, 100ths of a second
kMaxNoOIgniterTime    EQU          d'1000'       ;10 seconds
kMinNoOIgniterTime    EQU          d'100'        ;1 second
;
kDefaultO2LeadFlag     EQU          b'00000001'
;
kDefaultParam3         EQU          kDefaultO2LeadFlag
;
constant               TargetF628=1
constant               TargetF628A=0
constant               TargetF88=0
constant               UsePulseCounter=0
constant               UseServo=0

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