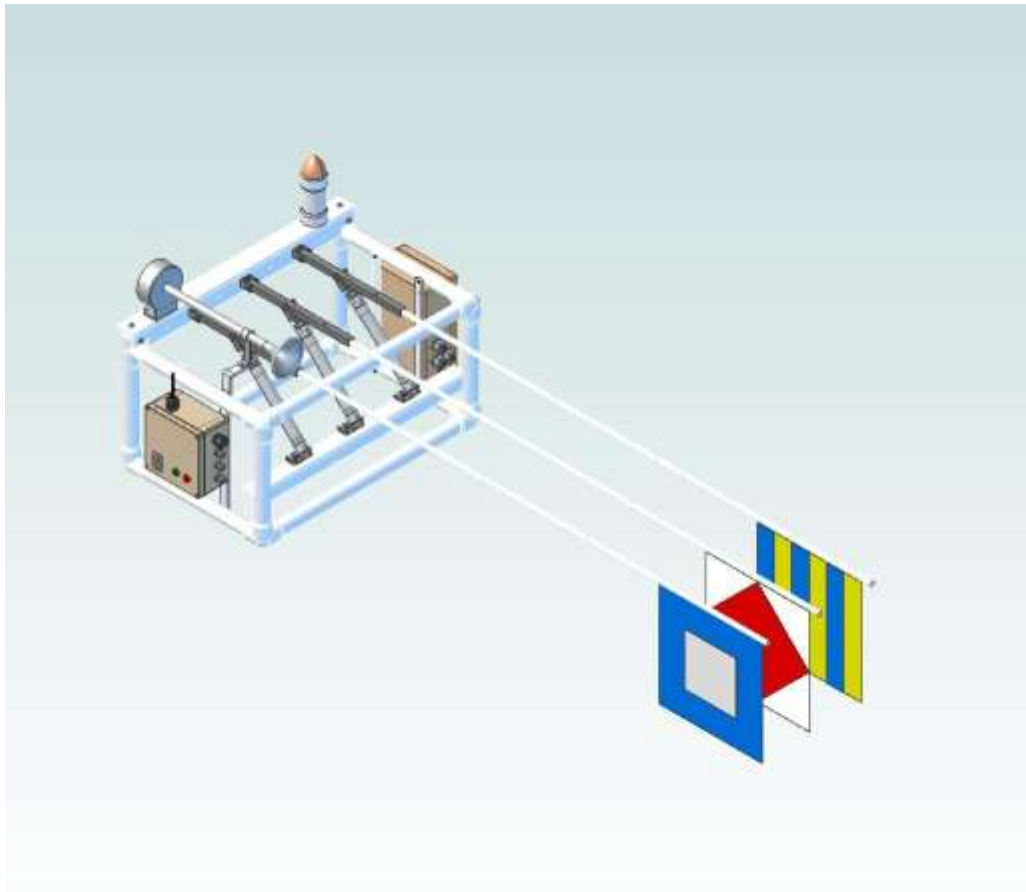


Fleet Racing Products, Inc.

RS1 Manual



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Warnings

- Save these instructions. Read all warnings and instructions before operating machine.
- This product is not a toy; do not allow children to operate.
- Inspect before use, do not use if parts are loose or damaged.
- Maintain product labels, if unreadable or missing, contact Fleet Racing Product for replacements.
- Stand clear when operating machine.
- Operator needs to ensure people are clear before operating machine.
- Keep bodily parts clear of moving components.
- Machine can be remotely operated.
- Horn is loud, use appropriate hearing protection.
- Read rest of manual for additional instructions and maintenance procedures.

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PN: 60-0006A

Welcome

Thank you for purchasing Fleet Racing Products' RS1. A computer controlled, remotely operated system for starting sailboat races. This product was the inspiration of sitting on a committee boat starting one too many races and missing out on the action. In a flash I realized that a machine can be made to run these flags and sound signals. Freeing me up to race! So here it is a machine to reliably and precisely run the starting sequence.

Thank You

Scott Nichols
President
Fleet Racing Products, Inc.

Quick start

Pre Start Setup

- Check tank pressure, refill when below 35 PSI.
- Connect air tank coupling.
- Turn on air by opening valve adjacent to air tank pressure gauge.
- Attach battery clips, red +, black –.
- Turn on main power switch, status light will glow.

To Start Race

- 10 seconds before race sequence is to begin push **Start** button on machine or remote.
- Horn will give a little beep, light will flash 1 second on, 1 second off till end of start sequence.

To Stop Race

- Press **Stop** button on machine or remote. Light will turn off for 2 seconds.

To do Self Test

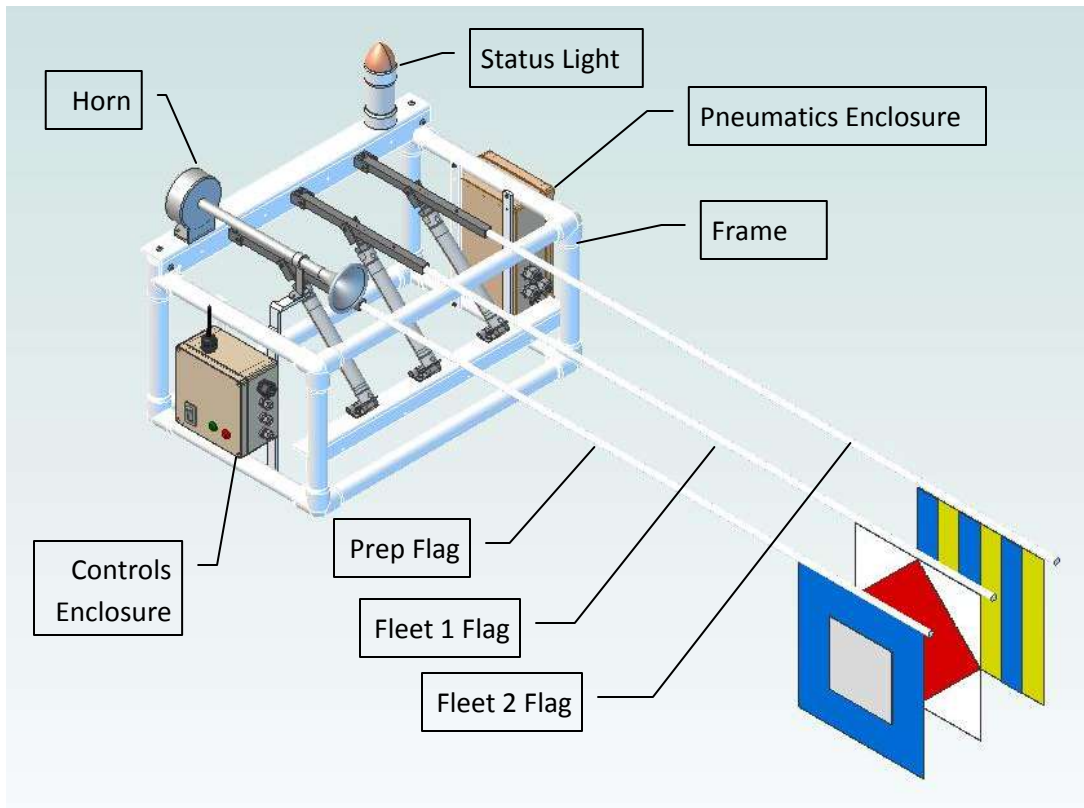
- Press **Start** button, then press **again** within 10 seconds.

Remote

- Press 'C' or 'X' button to wake up remote.
- Press 'S' 10 seconds before starting sequence is to begin.
- When in range, light flashes green every 5 seconds. (When out of range, no flashes.)

System Overview

Flag Frame



Controls Enclosure



On/Off – Switch to control power to the system.

Start/Test – Green button to start the race sequence, press 10 seconds before the start of race. If pressed again before race starts, then it goes through a self test sequence of Light flash, horn sound, flags actuate.

Stop – Red button to stop the race or test sequence by turning off horn, and flags return to home position.

Other switches/indicators might be visible on your model, dependent on options.

Remote Control

Remote can be used to control RS1 from a distance. The remote has an LED indicator positioned between the 'S' and 'X' buttons. The indicator turns red when a button is pushed, and flashes green every 5 seconds when the remote is awake and in range of the starting system.



The remote automatically goes to sleep to save battery power, press any, (but preferably the 'X' or 'C') to wake up remote and send command to starting system.

'S' Button – Start/Test button, same action as pushing Start/Test on controller enclosure.

'X' Button – Stop button, same action as pushing Stop on controller enclosure.

'C' Button – Used for checking if the remote is in range, will awake remote if asleep.

Theory of operation

The RS1 has 3 main systems for executing its function. An onboard embedded computer reads button pushes and executes routines that control the timing of the horn and flag signals. A high quality all stainless steel 118dB horn for making sound signals. Thirdly, flags mounted on ½" diameter fiberglass poles that are slid into holders machined out of 6061 aluminum. The holders pivot against the rear of the frame and the center of the holder is attached to a pneumatic actuator.

The base system is controlled by two buttons, a **Start** and **Stop** button. The buttons are located on the side of the system and on a remote. (Other controls might be available depending on options). The Start button starts the race sequence. The Stop button will stop the race sequence. If the user pushes the Start button a second time during the 10 seconds before the start of the race, the system will go into a self test mode where it will cycle the flags and horn. At any point a push of the Stop button will stop the sequence and return flags to home position. Feedback to the operator is provided by a light mounted at the top of the frame. The light flashes at a slow, 1 second on 1 second off, during a starting sequence, a fast rate during self test and off for 2 seconds when Stop is pushed.

When the user presses the Start button on the system or remote control, the light starts flashing, indicating it is in a starting sequence. For the first 10 seconds the system is in a mode ready to enter self test. At 10 seconds past Start press the RS1 switches to the start sequence. Sounding the horn and raising flags with 10 millisecond precision. Assuming the system is running the standard Racing Rules of Sailing, Rule 26, 5 minute cycle (other sequences available on request). The horn sounds for 3 seconds, and simultaneously the pneumatic solenoid is energized providing 30 PSI regulated air to the pneumatic cylinder. The cylinder extends and causes the Fleet 1 flag to pivot up from home position. At 1 minute into the start sequence the horn again sounds and the prep flag is raised. At 4 minutes into the start sequence the horn sounds a longer 5 second blast and the prep flags pneumatic solenoid is de-energized

and the pneumatic cylinder retracts, returning the flag to its home position. At 5 minutes into the start the horn sounds and Fleet 1 flag pivots down, starting the race. If this was a multi-fleet unit then the Fleet 2's flag would simultaneously pivot up starting a second race sequence.

Suggested Deployment Arrangements

Mount on a Race Committee Boat

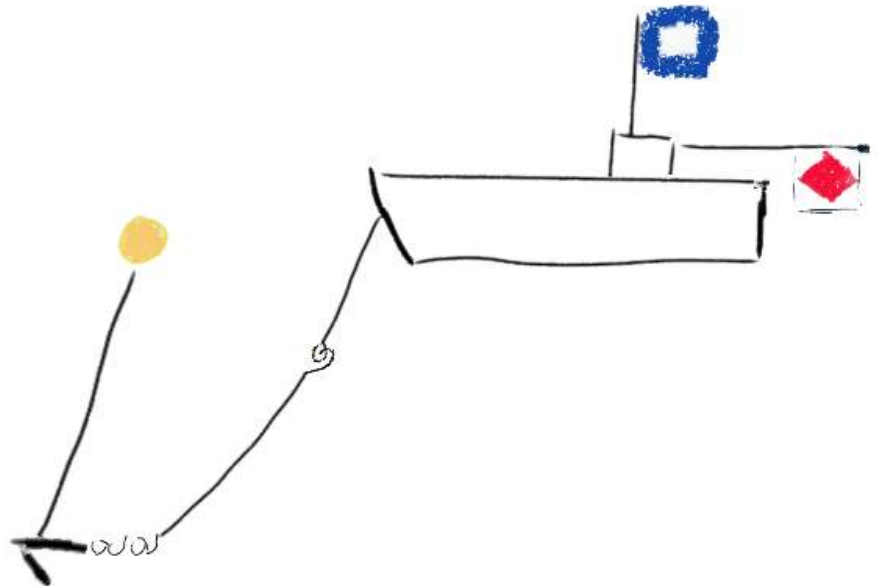
Mounting the RS1 on the committee boat turns starting a race from a group event to a one person show. Once the sequence has been started, the operator is free to keep an eye on the line and not have to watch the stopwatch. Lash the frame to a gunnel or cleat to keep from sliding around. Allow for clearance of the flags. Ensure personnel on board are clear of flags when system is in operation. Lash the air tank to ensure the air line is not under tension. The system can be powered off of the boat's battery or a standalone battery.

Mount in a Dinghy

Mounting in a dinghy is a typical scenario during coaching and self timed club races. The dinghy is towed out to the race course, anchored and then the race is started remotely. In a coaching scenario, this allows the coach to move around the fleet while still leaving a boat as the end of the starting line. Note that a simple frame might be needed to raise the RS1 above the level of the dinghy's gunnels. A cover over the dinghy is suggested to prevent the dinghy being swamped if waves break over the dinghy.

Typical arrangement:

- 1.25x water depth, 5Lb anchor, 6ft heavy chain (dependent on local conditions!).
- Snap clip attached to end of anchor line
- Trip line on anchor to float.
- Attached to dinghy bow is ~25ft tow line made of floating line, such as ½' polypropylene.
- Other end of tow line is an eye splice.



Maintenance

Daily use

Check air pressure, replenish when about 35 PSI, refilling to 100 PSI. If beginning an important regatta, fill tank.

Note, if in Salt Water – Wash down after every use.

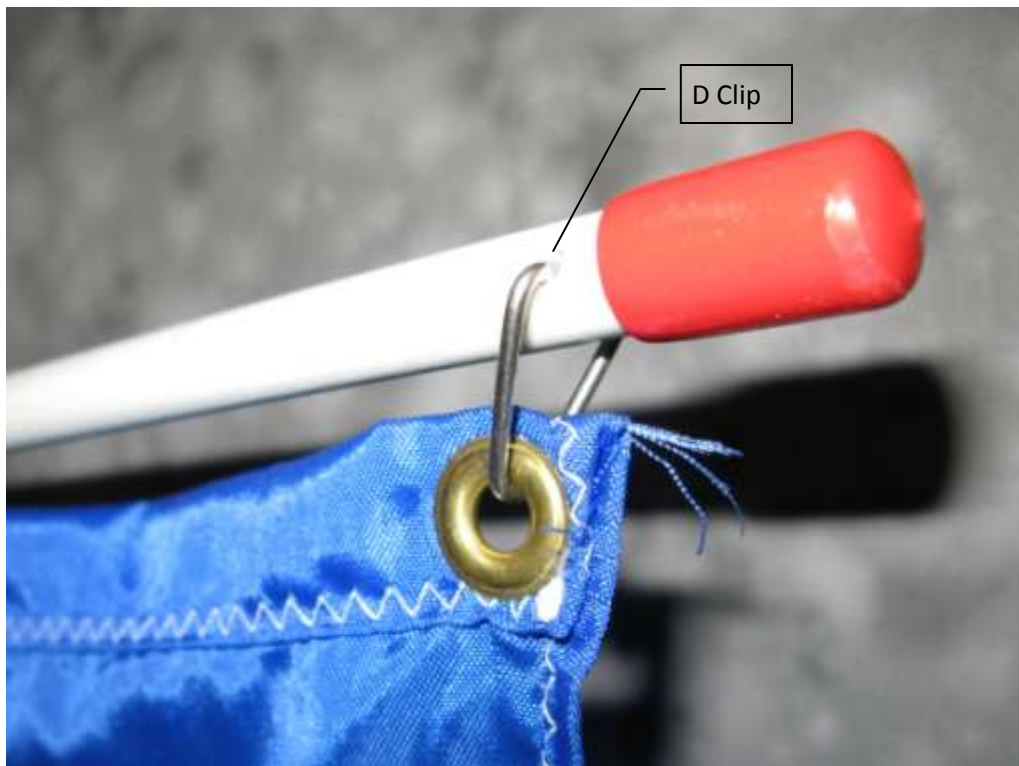
Monthly

Check and charge battery.

Inspect air tank for corrosion.

Changing Flags

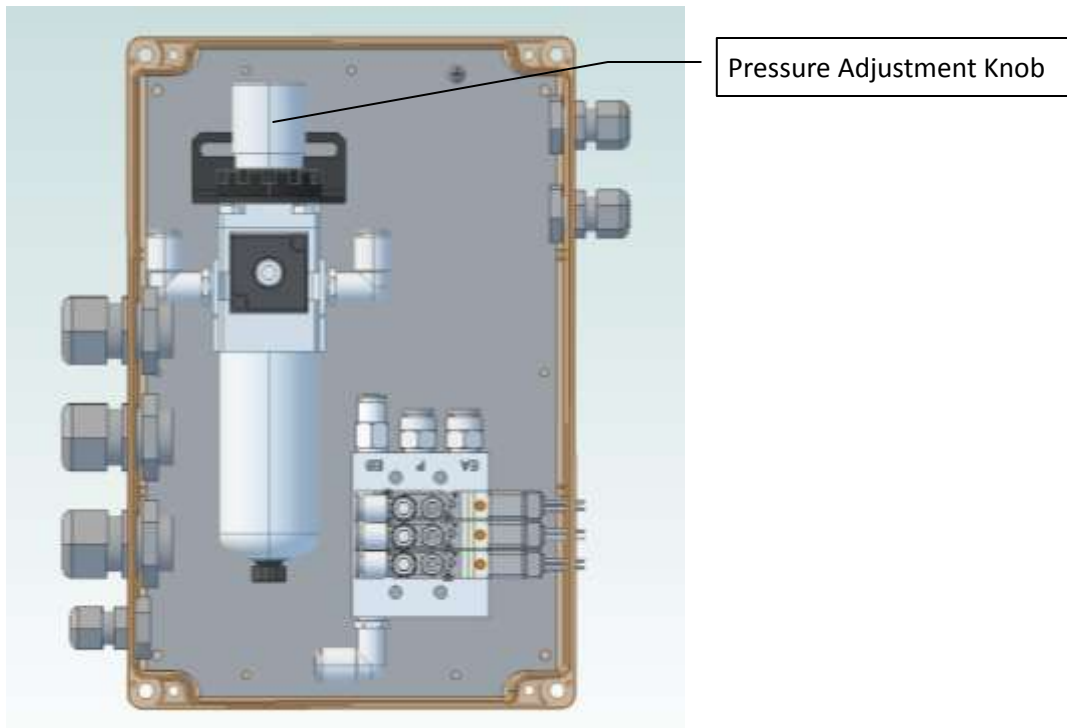
Changing the flags is done by removing the D clips using a pair of pliers. Opening up the base where it slides into the fiberglass pole, removing the flag, installing the new flag, and then reinserting the D clip and re-crimping.



If you are using a flag that does not have the same spacing for the grommets as the flags provided, you can drill a second hole using a 1/8 inch drill. It is suggested that use a drill press and centering vise. Note the orientation of the hole. You can also request from Fleet Racing Products a flagpole that has the spacing of the D clips to match your flag.

Changing air pressure to flag actuators

The default configuration of the race starting system is set up to operate in winds up to 30 miles an hour. Those that sail in an area that frequently sees winds over 30 miles an hour you may want to increase the pressure going to the air cylinders. As the wind speeds increase, the flags do not reach their full upright position. The wind pressure against the area of the flagpole creates the force that balances against the air pressure in the cylinders. If the wind pressure increases too much, then the flagpole will not be able to stand erect, presenting less area to the wind. The solution is to increase the air pressure at the regulator. The compromise is that each actuation of the cylinders will consume more air from the air tank. On the other hand, if you sail in an area that has light winds, you can decrease the air pressure in order for the tank to last longer.



1. Tools you will need: Phillips screwdriver, air tank with more than 80PSI.
2. Locate the pneumatics control enclosure.
3. Remove the enclosure cover by unscrewing the corner screws. Note that the screws are captive and stay with the cover.
4. Locate the regulator.
5. Increase the set point of the regulator by turning the knob on the top of the regulator clockwise. As you rotate the knob the pressure gauge will move.
6. It is suggested that you increase or decrease the pressure in five PSI increments.
7. While you have the cover open, also take a look at the sight glass to see if there's any water that needs to be removed. If yes, see the section *Check Air Filter/Regulator and Drain Water*
8. To reattach the cover, align the edges and tighten the screws up in an X pattern to ensure the cover seals correctly.

Note: There is a minimum air pressure of about 15 PSI in order to overcome the static friction of the air cylinders.

Check Air Filter/Regulator and Drain Water

1. Tools you will need: safety glasses, Phillips screwdriver, full air tank, paper towels
2. Turn off power and disconnect the battery clips.
3. Locate the pneumatics enclosure.
4. Remove the enclosure cover by unscrewing the corner screws. Note that the screws are captive and stay with the cover.
5. Locate the regulator.
6. Look at the sight glass to see if there's any water that needs to be removed.
7. If there is water in the sight glass you need to:
 - a. Place some paper towels on the bottom of the enclosure for the water to be captured.
 - b. Slowly loosen the drain on the bottom of the regulator.
 - c. When the regulator has drained, tighten the drain snugly.
 - d. Wipe down any components that were splattered.
 - e. Dispose of paper towels.
8. To reattach the cover, align the edges and tighten the screws up in an X pattern to ensure the cover seals correctly.

Change Battery in Remote

The remote requires two AAA batteries. They should be replaced annually if the system is used on a weekly basis, or biannually if used more frequently.

1. Tools you will need: number one Phillips head screwdriver, two AAA alkaline batteries.
2. On the bottom of the remote are three screws, remove.
3. Separate the remote casing by pulling gently apart.
4. The printed circuit board will now be exposed. Be careful not to touch the components on the board.
5. Remove the two batteries and discard per your local regulations for batteries.
6. Insert the replacement batteries, minding the polarity as printed on the circuit board.
7. Re-assemble the remote's covers, checking that the rubber gasket is not being pinched.
8. Tighten the screws until they are snug.

Seasonal Storage

Store in a dry location, with flagpoles removed from holder. Keep some pressure in the air tank.

Spring Commissioning

1. Inspect components for corrosion, abrasion and tightness. Repair and replace as appropriate. Contact Fleet Racing Products for replacement parts.
2. Fill air tank
3. Cycle air tank's pressure relief valve.
4. Change batteries in remote

5. Charge 12V battery.
6. Hook up and test cycle pneumatics.

Trouble Shooting

LED on remote does not light up when pressing start or stop button.

Most likely cause is the batteries in the remote are dead. To replace the batteries in the remote removed the three screws in the bottom of the case and separate the case to expose the printed circuit board. Then remove the AAA batteries and replace with fresh batteries.

Flags do not move.

- Check that valve on air tank is on.
- Check there is enough air pressure in tank, at least 35 PSI.
- Do self test, and ensure lights are turning on and off. This ensures the computer is functioning.

No Lights, no Horn, got nothing.

- Check Power switch is On
- Check battery is charged
- Check battery clamps are snug and corrosion free, and hooked to the correct polarity
- Check fuse in System Control Enclosure.
 - Turn off power switch.
 - Disconnect RS1 from battery
 - Open enclosure
 - Inspect fuse for failure
 - Replace if needed with 5mm x 20mm, 5 Amp slow blow fuse. Check spares kit, if none available, this size should be at most automotive stores, big box home improvement stores etc...

Specifications

Power:

Supply: 12 VDC, Standby 200mA, Max 5A

Power Cord: 6 ft with battery clips.

(Customer needs to supply battery)

Dimensions:

With no flags installed.

Height: 21.5 in

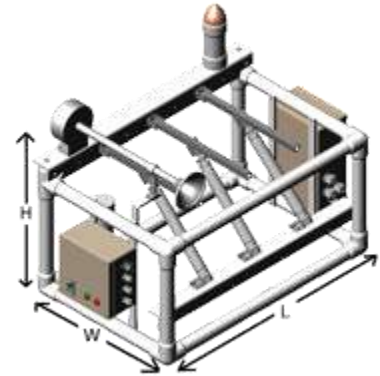
Width: 17 in

Length: 24 in for 2 flag system, plus 6 in per additional flag.

With flags installed and one flag raised (Maximum dimensions.)

Height: 79 in

Width: 89.5 in



Flagpole:

Length: 5 ft

Diameter: ½ in

Material: Fiberglass

Air Supply:

Hose: 6ft fully extended.

Tank: 3 Gallon, 135 psi maximum

(Customer needs to supply clean/dry compressed air)

Weight:

Varies per number of flags ordered, example for 3 flag system

Base Unit: 23.3 lbs

Flagpoles: 0.9 lbs each

Air Tank: 17.4 lbs

Estimated Shipping: 50 lbs.

FCC ID

System uses a transmitter/receiver with FCC ID 'OUR-XBEE'