SKYSENSE

BCON[1]

User Guide

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Contents

Introduction

Overview of the BCON1 Transmitter

BCON1 is an Automatic Dependent Surveillance-Broadcast (ADS-B) Stand Alone Transmitter for Class B0 equipment. BCON1 1090 MHz Non-Transponder-Device (NTD) is implemented independent of a Mode S transponder to provide the implementation of Extended Squitter (ES) for drones and other light vehicles/airplanes. The carrier frequency of ADS-B Message transmission is 1090 ±1 MHz, the ADS-B transmitted message is broadcasted automatically once per second. The Downlink Format (DF) 18 is used for transmitting ADS-B Messages from BCON1 transmitter.

BCON1 transmitter accepts own GPS position information via serial (RS232) interface connected directly to GPS receiver or via autopilot. The transmitter is preconfigured to use built in precision altimeter which provides accurate altitude data. BCON1 transmitter support mutual suppression which is needed when the ADS-B equipment is used along with pulse L-band equipment on board.

BCON1 can be supervised through proprietary Skysense Serial Communication Protocol (SSCP) or Command Line Interface (CLI) via a serial interface using terminal software or BCON1 windows application.

Specifications

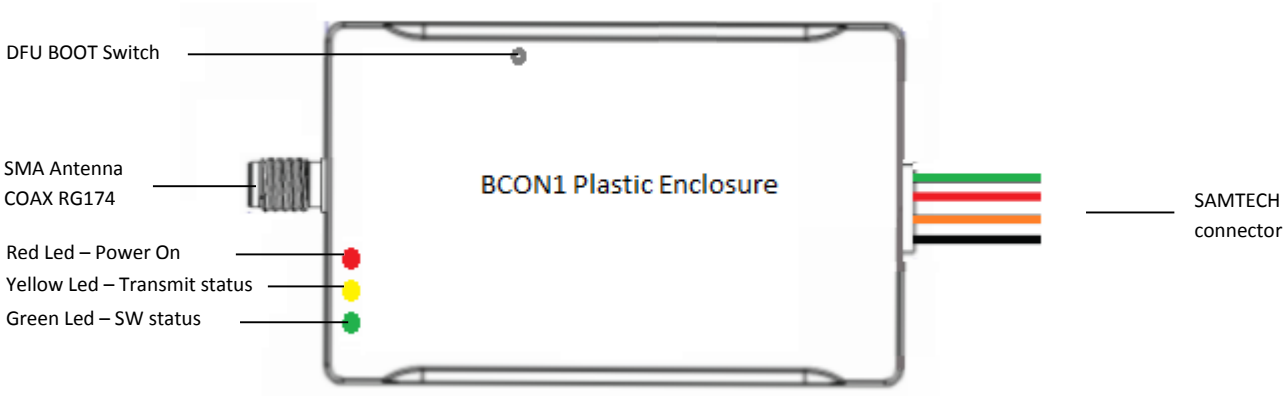
General	
Transmitter power	70W/48.45 dBm
Operating altitude:	Unrestricted
GPS:	NMEA-0183, RS232, adjustable data rate
Altitude:	Internal altitude encoder (0.1m accuracy) Max 5574 m (50 kPa min),Min -698 m (110 kPa max) Internal temperature sensor Min - 40 °C, max 85 °C
Electrical	
Power supply:	5V-15V
Power consumption (active):	2.5W
Power consumption (stand-by):	<0.1W
Compliance (on-going)	
FAA/EASA:	(E)TSO-166b
MOPS:	DO260B, Class B0
Software assurance:	DO-178C
Hardware assurance:	DO-254
Operating Environment:	DO-160G
Physical	
Weight:	35g (without enclosure)
Dimensions:	45 x 90 x 12 mm
Temperature range:	–30 – 85 °C

Get Started

Unpacking your parcel

Verify that following three items are included in the parcel:

- One BCON1 transmitter. The picture below shows BCON1 with its various interfaces
- One RS232 (DSUB female)-SAMTECH cable to connect BCON1 to your computer. This cable is only used for configuration of BCON1.
- One SAMTECH cable harness (with wires only on one end) to connect BCON1 to your drone.



Connect BCON1 to your computer

To use BCON1 with your computer, you need:

- RS232 (DSUB9 male)-USB adapter cable (*not included with BCON1*)
- Micro-USB cable for power supply (*not included with BCON1*)
- A PC with a USB port, and with Windows Operating system (Windows 7 or later version).
- Terminal emulator program.
- BCON1 GUI client

Set up BCON1

Setup on BCON1 can be made with either an RS232 terminal port (e.g. HyperTerminal) or using BCON1 GUI client.

Install BCON1 client

Install the latest version of windows application that is available on github public repository
https://github.com/Skysense-io/tools/tree/master/bcon1-client-gui

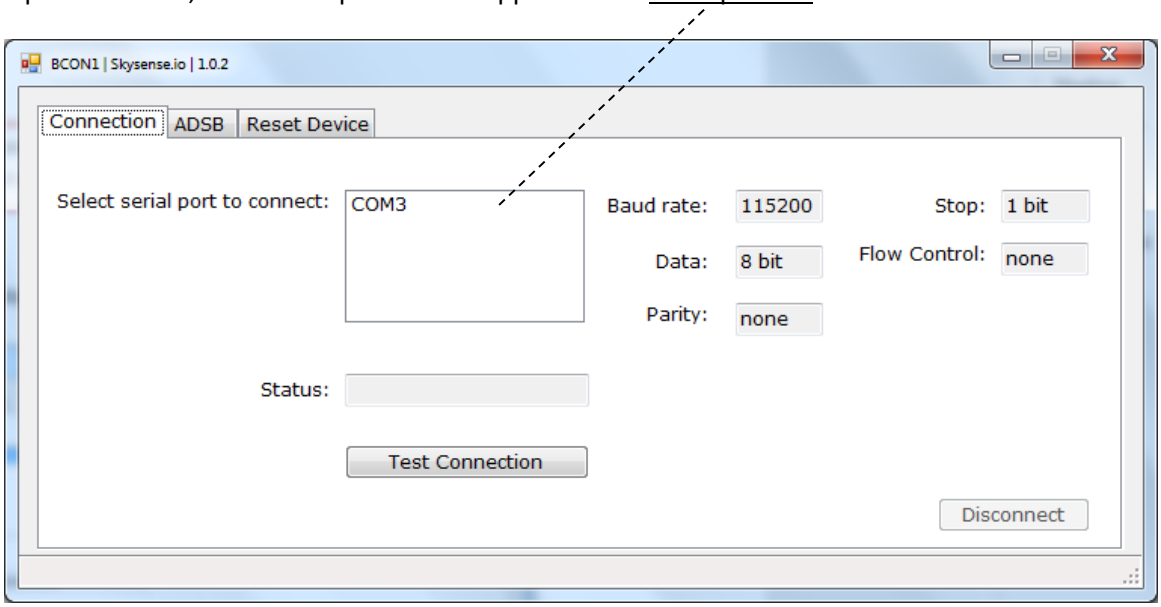
Install Terminal application

Download the terminal application of your choice and then open the application and follow the on-screen instructions.

Setup via BCON1 client

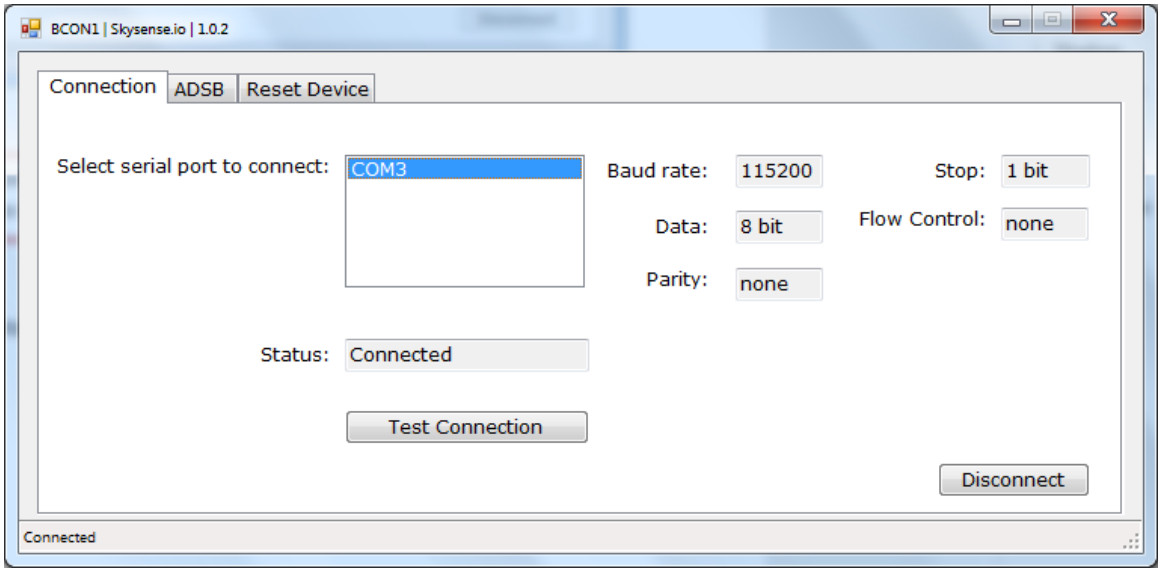
To connect BCON1 to your computer you need two cables, the RS232 (DSUB female)-SAMTECH-cable and an RS232 (DSUB9 male)-USB adapter cable. Note that the latter is not included in the parcel.

Open the client, a new com port should appear in the serial port list.



If no new Com port appears in the Serial Port list, check the cables and also make sure that there are no unknown hardware devices in the Device Manager.

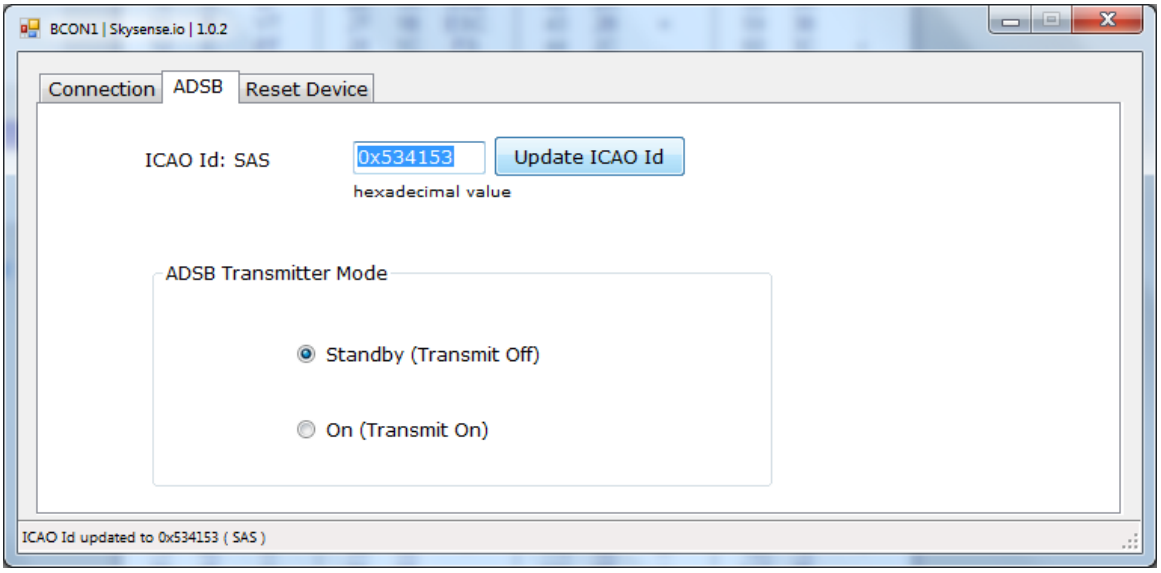
Click on the serial port to establish a connection with the BCON1.



Configure ICAO Id

Go to **ADSB** tab, and then change the transmitter mode to **Standby**.

- **ICAO Id** text field and **Update ICAO id** button will be enabled.
- Enter the new ICAO Id in hexadecimal and press the **Update ICAO Id** button to save changes.



You won't be able to change the ICAO Id when the transmitter mode is set to **On**.

Setup via Terminal

To connect BCON1 to your computer you need two cables, the RS232 (DSUB female)-SAMTECH-cable and an RS232 (DSUB9 male)-USB adapter cable. Note that the latter is not included in the parcel. Then open terminal application and setup serial port with below configuration:

- Baud rate: 115200
- Data: 8 bit
- Parity: None
- Stop: 1 bit
- Flow control: None

Verify the connection by typing **AT** in the terminal window, BCON1 will return in response the product id and acknowledgment.

```
AT
BCON1
OK
```

Configure ICAO Id

Enter the new ICAO Id in hexadecimal by using the **ICAO** command in the terminal window, BCON1 will return in response the acknowledgment.

```
ICAO=534153
OK
```

You won't be allowed to change the ICAO Id when the transmitter mode is set to **On**.

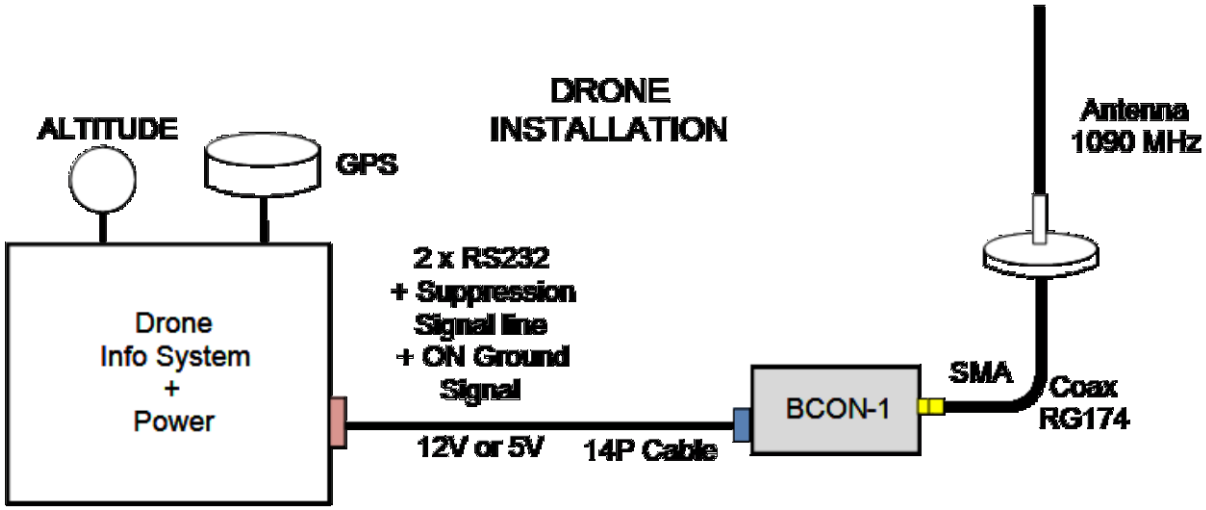
Turn off the transmission using **TXS** command and then set the new ICAO id, at the end turn on the transmission using **TXO** command.

```
TXS
OK

ICAO=534153
OK

TXO
OK

eps
New Values saved to EEPROM.
```

Connect BCON1 to your drone

Hardware Interfaces

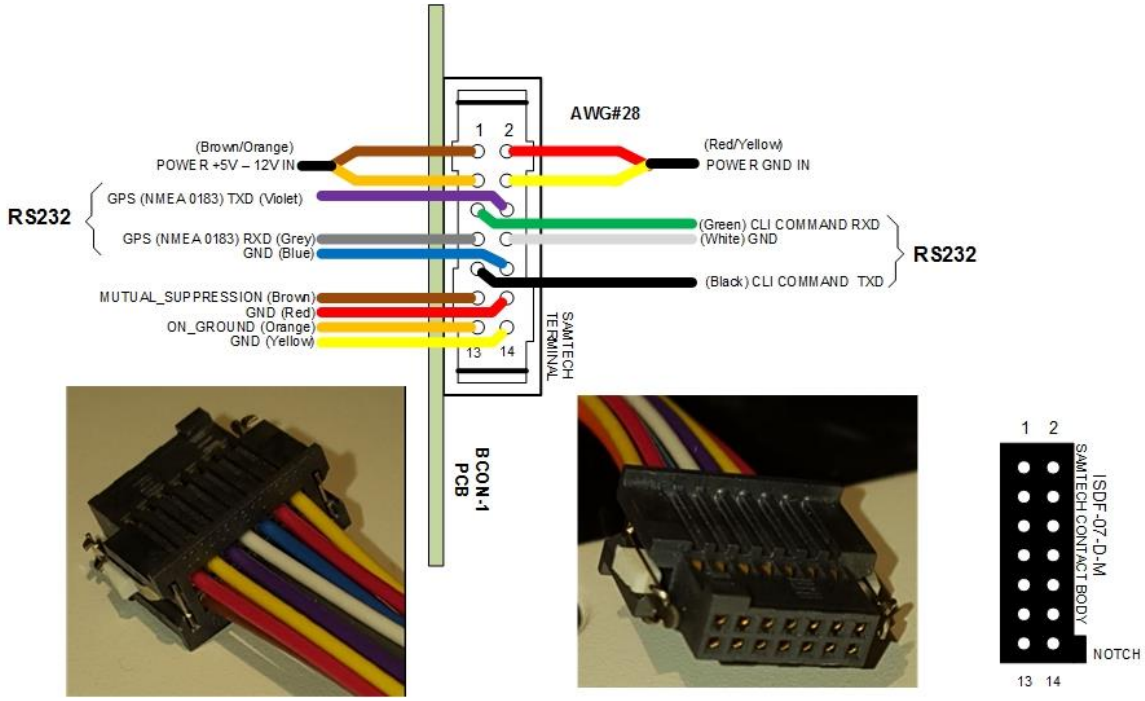
To use BCON1 with your drone, you need the SAMTECH cable harness, a single-ended 14 pole SAMTECH connector. The other end of the SAMTECH cable harness must be adapted depending on the physical interface of the autopilot. Note that it is possible to connect BCON1 to a GPS source if GPS data cannot be retrieved via autopilot. The wire size is AWG #28 and appropriate tools are recommended. See Appendix A for a complete pin map of the SAMTECH connector.



Command and Control Interface

The BCON1 transmitter can be controlled with a simple and light weight proprietary communication protocol or command line commands via a serial interface (RS232). If you want to integrate your UAV flight computer or autopilot, please contact Skysense AB for the SSCP specification document. See appendix B for CLI commands.

Appendix A: Pin Map of SAMTECH Connector



Appendix B: CLI Commands

BCON1 supports below Command Line Interface Commands over serial interface RS232 COMMAND.

Connect BCON1 to your computer and follow the instructions mentioned in section “Setup via Terminal”

Command	Description
AT	Display Product name
TXO	Turn off Mutual suppression i.e Transmit On
TXS	Turn On Mutual suppression i.e Transmit Off
GPS	Display GPS Information, e.g. Latitude, longitude, UTCDateTime
ICAO=<ABC>	Set ICAO Id
ALT	Display Altitude information in Foot
TX?	Display Transmit Status
ICAO?	Display ICAO Id
eps	Save values to non-volatile memory
SSCP	Switch to SSCP mode