SoarTronic ST1
project manual

This manual includes information of *SoarTronic* ST1
Please note, that this device is a result of an experimental project
and no guarantee of safety or usability can be given.
This device is used on your own risk!
Soartronic ST1 is available as a fully assembled plug and play device,

SoarTronic ST1

SoarTronic ST1 is IOIO UART interface board and **SparkFun IOIO module** build in one device. This electronics board can be used to connect four RS232 devices to an Android device running XCSoar program. It also provides charging power to the Android device using standard USB connector. *SoarTronic ST1* has two MAX232 microchips, which convert the IOIO board's TTL lever serial communication lines (UARTs) to RS232 lines. *SoarTronic ST1* also filters the electromagnetic noise caused by the 12V/5V regulator.

SoarTronic ST1 has three RJ45 connectors. RJ45 connectors (UART0) FLARM and DISPLAY are designed for IGC standard pinout for easy connection with FLARM units, and they can also work as splitter. *SoarTronic ST1* can be connected between FLARM unit and other device, like external display. Also the third RJ45 connector (UART1) has IGC standard pinout, and can connect to most FLARM devices and loggers. Before connecting any devices make sure that the wiring is correct. RJ45 leads use 8 wires and Rj12 6 wires. IGC standard RJ12 male connectors used in LX FLARM devices can be connected to female RJ45 connectors.

The 12V pins of the RJ45 connectors are connected into internal 12V line. 12V input can be connected trough any of the RJ45 connectors using IGC standard cabling, or trough dedicated 12 V input of *SoarTronic ST1*. If 12V input is connected into the *SoarTronic ST1* 12V and GND inputs, it is protected with a diode against reverse polarization, and this 12V can be distributed into all RJ45 connectors. It is recommended to feed operating voltage to FLARM units from *SoarTronic ST1*.

Please pay attention to 12V dc supply line of these RJ45 connectors, especially if you have several sources for operating voltage. The pins 7 and 8 are connected with internal 12V directly. Remove jumper behind each RJ45 connector or use RJ cable without 7 and 8 wires connected if you do not want to connect RJ45 connectors with the same 12v potential with the ST1.

Fourth connector D-sub (UART2) can be used to connect any RS232 compatible device, UART2 does not have powersupply output.

Last RS232 line have connection points for cabling to external connectors. It is recommended, that the user of this board solders appropriate length shielded cable into these points, and connects directly with units like variometers and loggers. Connection points to GND for cable shields are provided, and since unshielded communication cables are significant source of electromagnetic noice, it is recommented to connect shiels to ground in both ends, if possible. Many devices have build-in male Sub D9 connector, which is grounded in the devices metal housing.

Please note that while it is possible to feed 12V in to the *SoarTronic ST1* it is recommended to use the dedicated 12V input line. This is because the 12V input is filtered and protected for reverse current.
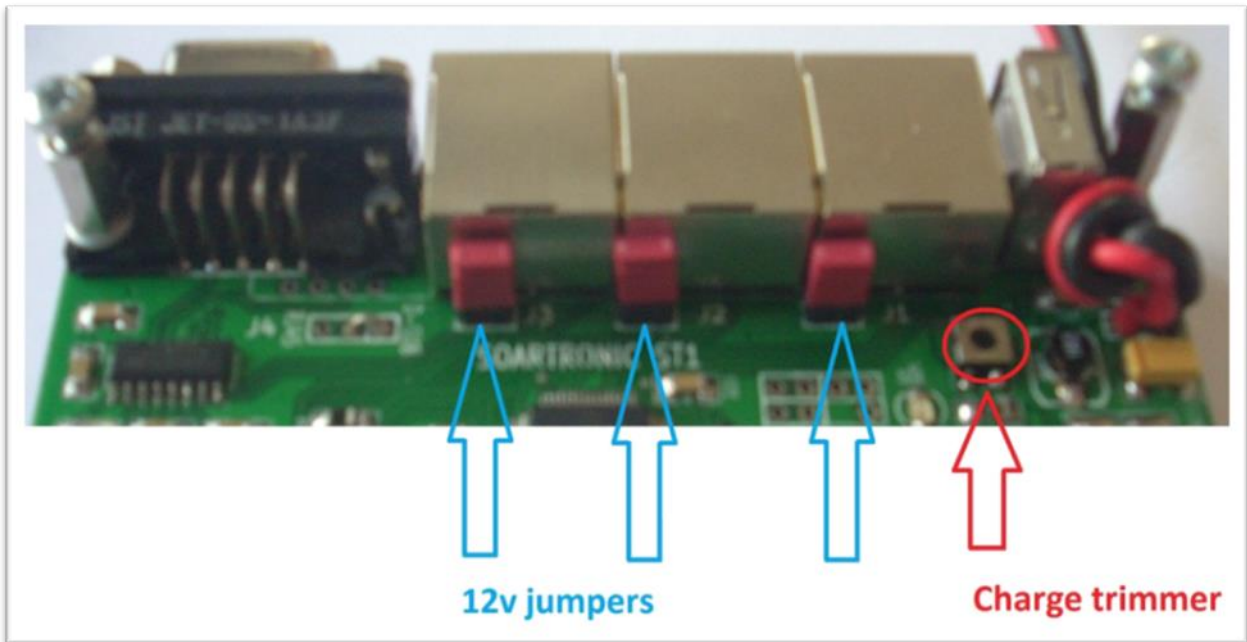
12v supply voltage for the ST1 can be fed either through the any RJ45 connector (pins.7 and 8) or through power supply line(red-black wires).
External devices can be powered trough RJ45 connector (pins.7 and 8).
Jumpers behind RJ connectors are used for enable/disable 12v line for the external devices.

Flarm - display port combination (uart0), includes a splitter which allows simultaneous use of flarm, display and android.

Adjust charge trimmer for more or less charge current.
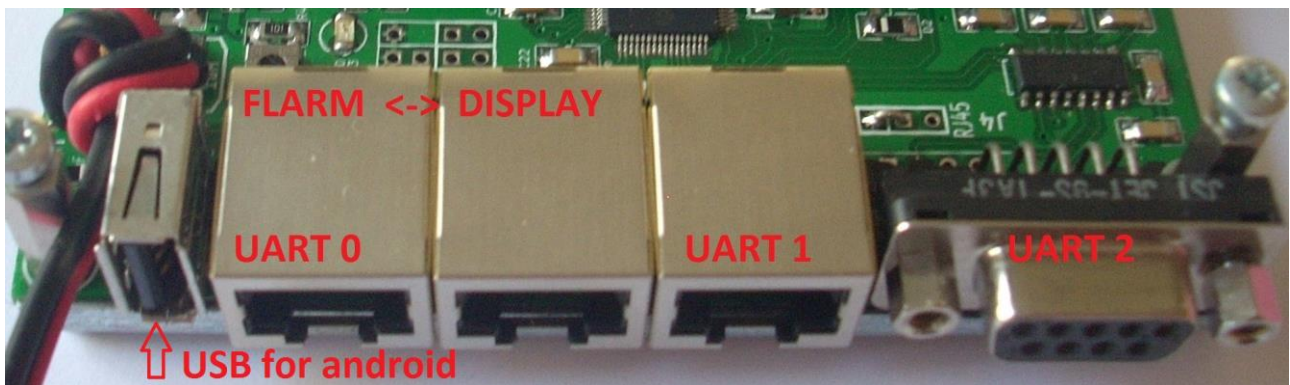
Port description of Soartronic ST1

Soartronic RJ45 port pin numbers and description.

Pin description of rj45 port:

1 GND
2 GND
3 TX
4 RX
7 12V
8 12V

5   1

2 TX
3 RX
5 GND
8 GND

8
12V
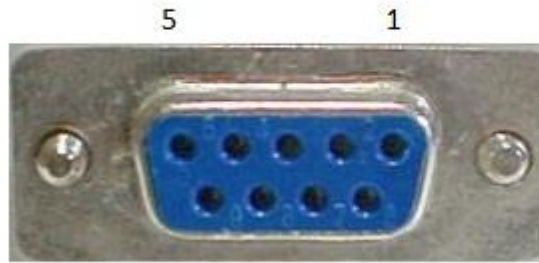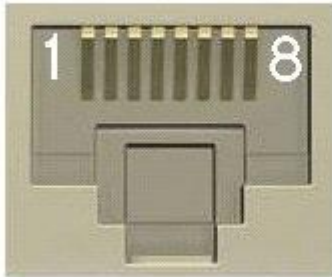
1
GND
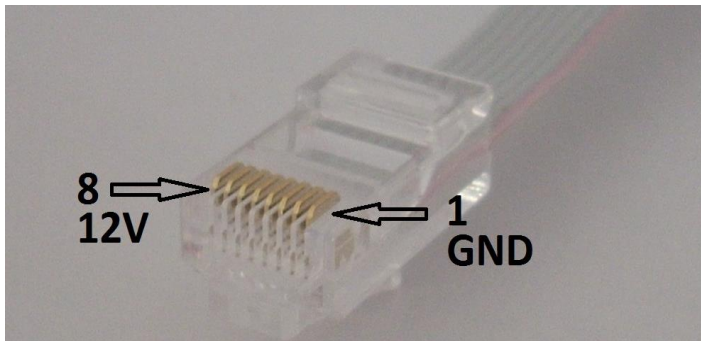
SOARTRONIC RJ45 AND D-SUB CONNECTOR DESCRIPTIONS

UART INTERFACE, BT1, ST1
UART0

GND 1
GND 2
TX 3
RX 4
5
6
7
8

FLARM
RJ45   J?

SHIELD   9

DISPLAY
RJ45   J?

1
2
3
4
5
6
7
8

SHIELD   9

12V 7
12V 8

IOIO CONNECTIOS

PLEASE NOTE! SOARTRONIC RJ45 PORT PIN NUMBERS
FOLLOW COMPONENT PIN NUMBERS!
IGC PIN NUMBER ORDER IS REVERSED!
IOW. SOARTRONIC PIN 1 IS IGC PIN 8 !

WHEN YOU MAKE A CABLE, INSTEAD OF NUMBERING
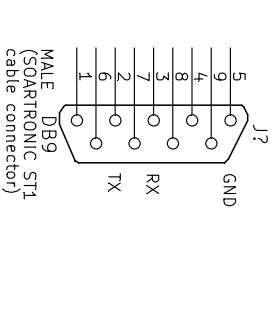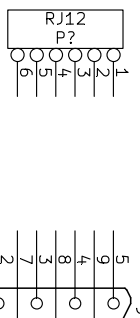USE THE GND, TX AND RX LABELLING.
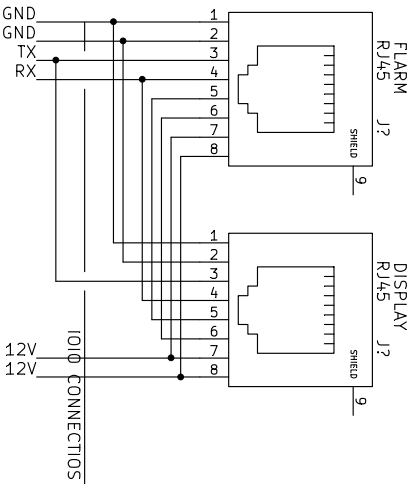
UART INTERFACE, ST1
UART1

GND 1
GND 2
TX 3
RX 4
× 5
× 6
12V 7
12V 8

UART1
RJ45   J?

SHIELD   9

× = NO CONNECTION

ST1 UART2
D-SUB9 MALE

J?

GND   5
       9
×   4
       8
GND   3
RX   7
       2
TX   6
×   1

DB9

File: rj_ports.sch
Sheet: /
Title: noname.sch
Size: A4   Date: 12 apr 2013
KiCad E.D.A.   eeschema (2011-07-08 BZR 3044)-stable

Rev:
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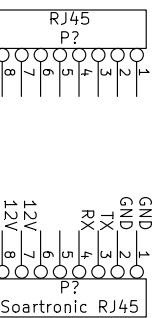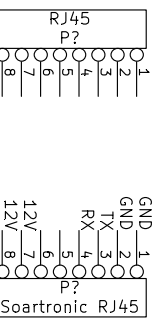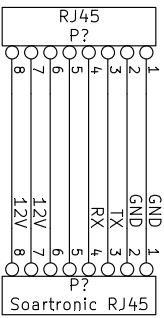1:1 IGC RJ12(FLARM) — RJ45 CABLE
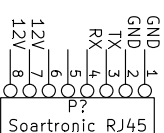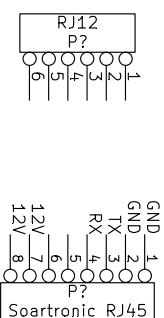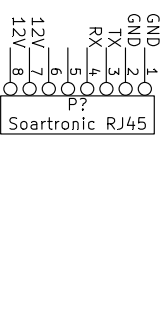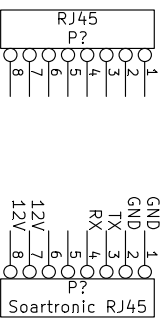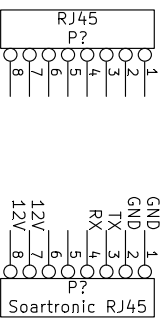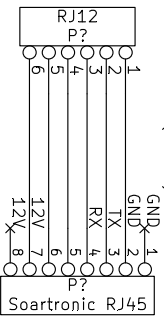
1:1 IGC RJ45 — RJ45 CABLE
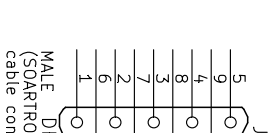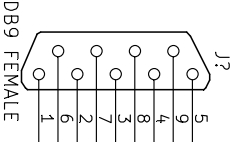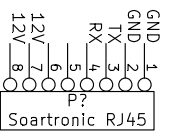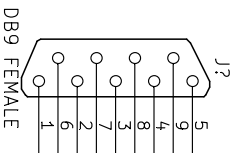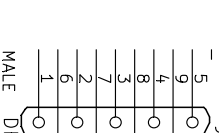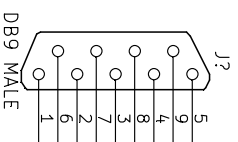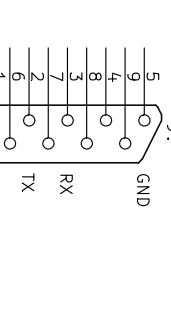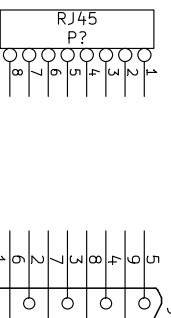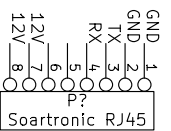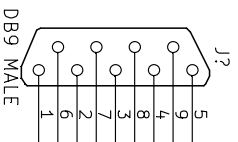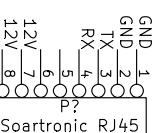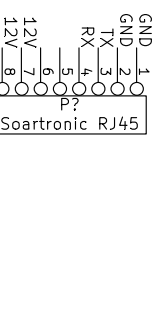
RJ12
P?

RJ45
P?

P?
Soartronic RJ45

GND 1
GND 2
TX 3
RX 4
12V 5
12V 6
12V 7
12V 8

DB9 MALE
J?

DB9 FEMALE
J?

RJ45
P?

RJ45
P?

P?
Soartronic RJ45

P?
Soartronic RJ45

P?
Soartronic RJ45

P?
Soartronic RJ45

P?
Soartronic RJ45

RJ12
P?

RJ45
P?

RJ45
P?

RJ45
P?

MALE DB9
(SOARTRONIC ST1
cable connector)
J?
TX
RX
GND

MALE DB9
(SOARTRONIC ST1
cable connector)
J?
TX
RX
GND

DB9 FEMALE
J?
GND

DB9 MALE
J?
GND

RJ12
P?

RJ12
P?

MALE DB9
(SOARTRONIC ST1
cable connector)
J?
TX
RX
GND

MALE DB9
(SOARTRONIC ST1
cable connector)
J?
TX
RX
GND

PLEASE NOTE! SOARTRONIC RJ45 PORT PIN NUMBERS
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IOW. SOARTRONIC PIN 1 IS IGC PIN 8 !

NC = NO CONNECTION