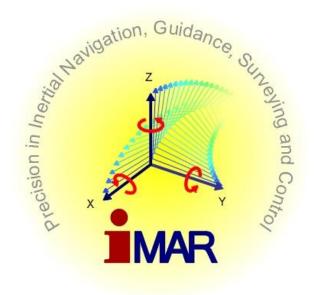# iSRIF-H, iSRIF-S

Steering Robot Interface

- INTERFACE DESCRIPTION -

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CHANGE RECORD

Date	Issue	Paragraph	Comments
20.08.09	1.0	All	Initial release
20.10.09	1.01	6	Chapter 6 extended
21.08.14	1.02	All	Separation between iSRIF-H and iSRIF-S

TABLE OF CONTENTS

1 GENERAL

1.1 Scope

This document describes the electrical and mechanical interface of the **s**teering **r**obot **i**nter**f**ace iSRIF. It is used to send inertial data (position, angular rate, attitude and heading) from an inertial measurement system (iTraceRT, iNAV-FMS) to a steering robot of manufacturer ABD (Anthony Best Dynamics) or any other manufacturer of such devices. The protocol can be adapted to user's requirements (if other steering robots shall be used).

Two different versions of iSRIF are available:

- iSRIF-H   it reads inertial data from a CAN interface and provides them in the format as requested by the steering robot via Ethernet / UDP

- iSRIF-S   it is a software IP which runs inside of the inertial navigation system and provides the inertial data in the format as requested by the steering robot via Ethernet / UDP (requires an inertial measurement system with integrated Ethernet interface). This version is described in the appendix of this document.

Related document for
     - iTraceRT-F200: iTraceRT-F200 User Manual (DOC-number DOC090824003)
     - iTraceRT-F400: iTraceRT-F400 User Manual (DOC-number DOC110207001)

2 GENERAL DESCRIPTION OF iSRIF-H

The iSRIF-H is an interface which is used to take data from an inertial measurement system via CAN interface and to send data to the steering robot via Ethernet (UDP) or RS232.

The iSRIF-H contains some integrated processing power to calculate data required from the steering robot from the data obtained from the inertial measurement system.

The iSRIF-H supports currently the iTraceRT Inertial Measurement System on the one side and the ABD steering robot on the other side.

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iSRIF-H, iSRIF-S
Interface Description

3 MECHANICAL INTERFACE OF iSRIF-H

The mechanical interface and the orientation of the sensitive axes is defined in the interface drawings given in the appendix. The dimensions of the interface box are approx. 180 mm x 105 mm x 45 mm (excluding connector).

4 COORDINATE SYSTEMS

The coordinate system of the iTraceRT-F200 / iTraceRT-F400 is given on the cover of the IMU. It is recommended to install the iTraceRT with its y axis pointing forward in the vehicle (x axis pointing to the right side, z pointing upwards).

If the iTraceRT is mounted in another direction, the parameter VEHICLEBODYROTATION has to be set and stored inside the iTraceRT.

The transformation between the iTraceRT coordinate system (airborne coordinate system: y forward, z upwards) and the coordinate system of DIN 70'000 (x forward, z upwards) is performed inside the iSRIF system. The iSRIF system also allows to estimate the offset of the sideslip angle (being done during the motion phases where only very low change of heading and sufficient longitudinal velocity is detected).

The iSRIF-H has no sensitive axes.

5 ELECTRICAL INTERFACE OF iSRIF-H

The iTraceRT is connected with its CAN interface (SubD9, male) to the iSRIF-H. Baudrate is 1 MBd.

The steering robot is connected with its Ethernet UDP port (RJ45) to the iSRIF-H (up to 100 MBit/s, RJ45).

A RS232 Debug and Configuration Interface is available at the iSRIF-H to configure certain parameters or to monitor some communication.

The power supply of the iSRIF-H is 10…24 V DC. Power dissipation is 2 W.

It is prohibited to open the unit. Connecting other devices may lead to a loss of system configuration or damage of the device and will stop the warranty period.

5.1 Connector and Pin Assignment of iSRIF-H

All electrical connections are provided on one connector of type MIL-C-38999-24WB35PN.

Assignment:

1	VIN
2	GND
3	CANL
4	CANH
5	GND
6	RS232-RxD
7	RS232-TxD
8	GND
9	-
10	ETH-Rx+
11	ETH-Rx-
12	ETH-Tx+
13	ETH-Tx-

System cable:

Power (4mm pin red and black)
CAN (SubD9 female)

2	CANL
7	CANH
3	GND

RS232 (SubD9 male)

2	RS232-RxD
3	RS232-TxD
5	GND

Ethernet (RJ45 plug)

1	ETH-Tx+
2	ETH-Tx-
3	ETH-Rx+
6	ETH-Rx-

5.2 Configuration

To use the iSRIF-H with an iTraceRT (beside your usual iTraceRT configuration) you just have to activate the iTraceRT CAN bus interface using the iTraceRT-Command software or a terminal program and the iTraceRT command

```
"canconfig CAN2 enable 1M 0x50 0xFFFF insgps"
```

There is nothing to configure on the iSRIF-H.

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iSRIF-H, iSRIF-S
Interface Description

6 SPECIFICATION OF iSRIF-H

Usage: Interface between iTraceRT-F200 and ABD steering robots
to control the steering robot with data obtained from the
iTraceRT_F200 8position, angular rate, attitude, heading)

Interface: CAN bus to iTraceRT-F200 / -F400, data rate 100 Hz, 1 MBit/s
Ethernet / UDP to ABD steering robot, 100 MBit/s
RS232 for configuration and debug, 115.2 kBd

Connector: MIL-C-38999-24WB35PN (male)

Power Supply: 10…24 V DC, 2 W

Temperature Range: -30…+71 °C operating
-40…+85 °C storage

Size: 105 x 180 x 45 mm

Weight: 540 grams

Protection Class: IP66

7 APPENDIX: iSRIF-S

While the iSRIF-H comes as a hardware, which transforms a CAN data stream into a Ethernet data stream, which is read by the steering robot, the iSRIF-S is a pure software / firmware solution. It is implemented as an IP core on the processor of the inertial navigation system and provides the required data for the steering robot.

Details are given in DOC11028022 (Steering Robot Interface iSRIF-S for iTraceRT-F400).