

SRT Avant Fleet User's Manual

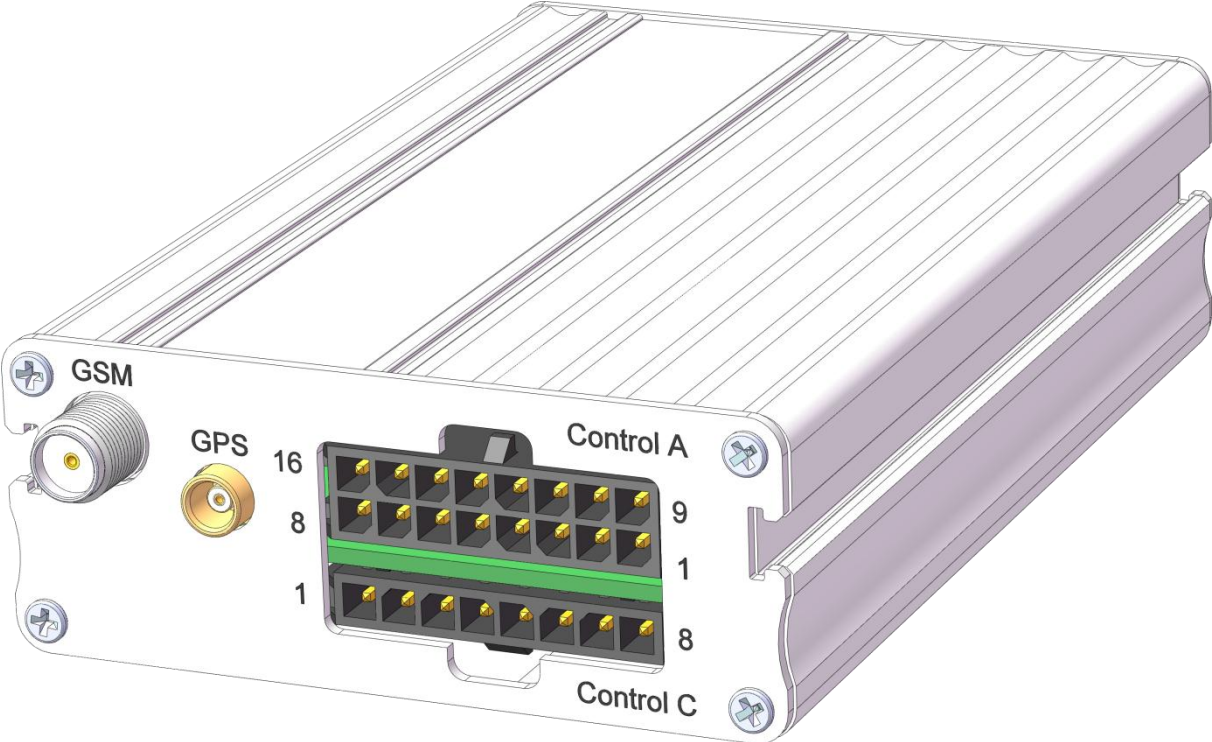




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Introduction to SRT Avant Fleet

Scope

This document describes the hardware SRT Avant Fleet.

SRT Avant Fleet is based on a quad-band WISMO™ Q2687 module and includes a SiRF Star III based GPS solution.

General Characteristics

General

- Quad Band GSM modem E-GSM 850/900/1800/1900
- GPRS Class 10
- Class 4 (2W at 850/900 MHz)
- Class 1 (1W at 1800/1900 MHz)
- SMS and GPRS communication
- Internal 1.8V/3V SIM interface
- Fully type approved according to GSM Phase 2+ specifications
- 12-36V DC power supply or single-cell Li-Ion battery operation with built-in charger circuitry
- 20-channel GPS receiver

Electrical

Power supply 12-36V DC, 5VA peak during transmission peaks

Maximum 2A peak power consumption during transmission pulses in GSM 900 at 2W

Physical

90x59x23.5mm external dimensions

Weight: 200g

Operating temperature: -20°C to +55°C

Storage temperature: -35°C to +85°C

Interfaces

SMA type antenna connector, 50Ω, for GSM

MCX type antenna connector, 50Ω, for GPS

SIM card holder with 1.8V/3V SIM interface

16-pin (2x8) Microfit connector (Control A)

12-pin (2x6) Microfit connector (Control B)

8-pin (1x8) Microfit connector (Control C)

Safety Precautions

RF Exposure

General Statement on RF Energy

SRT Avant Fleet contains a transmitter and a receiver. When it is ON, it receives and transmits RF energy. When you communicate with SRT Avant Fleet, the system handling your communication controls the power level at which your personal protection device transmits.

Distraction

Driving

Full attention must be given to driving at all times in order to reduce the risk of an accident. Using your unit while driving causes distraction and can lead to an accident. You must comply with local laws and regulations restricting the use of wireless devices while driving.

Product Handling

General Statement on Handling and Use

You alone are responsible for how you use your device and any consequences of its use. You must always switch off your device wherever the use of a wireless device is prohibited. Use of your device is subject to safety measures designed to protect users and their environment.

- Always treat your device and its accessories with care and keep it in a clean and dust-free place.
- Do not expose your device or its accessories to open flames or lit tobacco products.
- Do not expose your device or its accessories to liquid, moisture or high humidity.
- Do not drop, throw or try to bend your device or its accessories.
- Do not use harsh chemicals, cleaning solvents, or aerosols to clean the device or its accessories.
- Do not paint your device or its accessories.
- Do not attempt to disassemble your device or its accessories, only authorized personnel must do so.
- Do not expose your device or its accessories to extreme temperatures.
- Please check local regulations for disposal of electronic products.

Electrostatic Discharge (ESD)

Do not touch the SIM card's and Microfit connectors' metallic parts.

Air Bags

Do not place the unit in the area over an air bag or in the air bag deployment area. Store the unit safely before driving your vehicle.

Seizures/ Blackouts

The unit can produce a bright or a flashing light.

Emergency Calls

This equipment, like any wireless equipment, operates using radio signals, which cannot guarantee connection in all conditions. Therefore, you must never rely solely on any wireless equipment for emergency communications.

Loud Noise

This extension unit is capable of producing loud noises which may damage your hearing.

Electrical Safety

Accessories

Use only approved accessories. Do not connect with incompatible products or accessories.

Faulty and Damaged Products

Do not attempt to disassemble the equipment or its accessory. Only qualified personnel must service or repair the equipment or its accessory. If your equipment or its accessory has been submerged in water, punctured, or subjected to a severe fall, do not use it until you have taken it to be checked at an authorized service center.

Interference

General Statement on Interference

Care must be taken when using the device in close proximity to personal medical devices, such as pacemakers and hearing aids.

Hearing aids

People with hearing aids or other cochlear implants may experience interfering noises when using wireless devices or when one is nearby. The level of interference will depend on the type of hearing device and the distance from the interference source, increasing the separation between them may reduce the interference. You may also consult your hearing aid manufacturer to discuss alternatives.

Medical Devices

Please consult your doctor and the device manufacturer to determine if operation of your equipment may interfere with the operation of your medical device.

Hospitals

Switch off your wireless device when requested to do so in hospitals, clinics or health care facilities. These requests are designed to prevent possible interference with sensitive medical equipment.

Aircraft

Switch off your wireless device whenever you are instructed to do so by airport or airline staff.

Interference in Cars

Please note that because of possible interference to electronic equipment, some vehicle manufactures forbid the use of wireless devices in their vehicles.

Explosive Environments

Petrol Stations and Explosive Atmospheres

In locations with potentially explosive atmospheres, obey all posted signs to turn off wireless devices such as SRT Avant Fleet or other radio equipment.

Areas with potentially explosive atmospheres include fuelling areas, below decks on boats, fuel or chemical transfer or storage facilities, areas where the air contains chemicals or particles, such as grain, dust or metal powders.

Blasting Caps and Areas

Turn off your wireless device when in a blasting area or in areas posted turn off “two-way radios” or “electronic devices” to avoid interfering with blasting operations.

Declaration of RoHS Compliance

To minimize the environmental impact and take more responsibility to the earth we live in, this document shall serve as formal declaration that the SRT Avant Fleet manufactured by SCANDINAVIAN RADIO TECHNOLOGY AB is in compliance with the Directive 2002/95/EC of the European Parliament – RoHS (Restriction of Hazardous Substances) with respect to the following substances:

- (1) Lead (Pb)
- (2) Mercury (Hg)
- (3) Cadmium (Cd)
- (4) Hexavalent Chromium (Cr (VI))
- (5) Polybrominated biphenyls (PBB's)
- (6) Polybrominated diphenyl ethers (PBDE's)

(Compliance is evidenced by written declaration from our suppliers, assuring that any potential trace contamination levels of the substances listed above are below the maximum level set by EU 2002/95/EC, or are exempt due to their application.)

The SRT Avant Fleet manufactured by SCANDINAVIAN RADIO TECHNOLOGY AB, meets the requirements of EU 2002/95/EC.

WEEE Notice

The Directive on Waste Electrical and Electronic Equipment (WEEE), which entered into force as European law on 13th February 2003, resulted in a major change in the treatment of electrical equipment at end-of-life. The purpose of this Directive is, as a first priority, the prevention of WEEE, and in addition, to promote the reuse, recycling and other forms of recovery of such wastes so as to reduce disposal.



1. When this crossed-out wheeled bin symbol (WEEE logo) is attached to a product it means the product is covered by the European Directive 2002/96/CE.
2. All electrical and electronic products should be disposed of separately from the municipal waste stream via appointed by the government or the local authorities.
3. The correct disposal of your old appliance will help prevent negative consequences for the environment and human health.

For more information about electronic and electrical waste equipment disposal, recovery, and collection points, please contact your local city center, household waste disposal service, shop from where you purchased the equipment, or manufacturer of the equipment.

EC DECLARATION OF CONFORMITY

The undersigned, representing the following manufacturer

Name:	Scandinavian Radio Technology AB
Address:	Box 23 162 11 Vällingby, Sweden
Telephone:	+46 8 620 2960
Telefax:	+46 8 620 2979

herewith declares that the product

Type of equipment:	GSM/GPRS/GPS device
Brand name/trade mark:	SRT 278 Avant Fleet
Model/type:	SRT 278 Avant Fleet
Batch/serial number:	35211900000000 to 35211900999999

complies with the essential requirements of Article 3 of the R&TTE 1999/5/EC directive. The following standards have been applied:

<i>Reference no</i>	<i>Title</i>
EN 60 950-1:2005 EN 60 950-1/A11:2009	<i>R&TTE Directive related to safety</i>
EN 301 489-1 V1.8.1 EN 301 489-7 V1.3.1	<i>R&TTE Directive related to electromagnetic compatibility</i>
EN 301 511	<i>R&TTE Directive related to efficient use of radio frequency spectrum</i>

Vällingby 2010-02-12



Tahir Albayrak
Managing Director of Scandinavian Radio Technology AB

Hardware Interfaces

SIM interface

A 1.8V/3V SIM Card Reader is integrated in SRT Avant Fleet. The SIM interface signals are protected by transient voltage suppression diodes to prevent any Electro Static Discharge. The interface is fully compliant with GSM 11.11 recommendations concerning SIM functions.

I/O interface

The SRT Avant Fleet is equipped with three I/O connectors. The I/O signals are managed through the firmware commands.

Control A & Control C

Control A is a 16-pin Microfit connector with two rows of eight pins each. Control C is an 8-pin Microfit connector with one row of eight pins.

Figure 1 - Control A & C

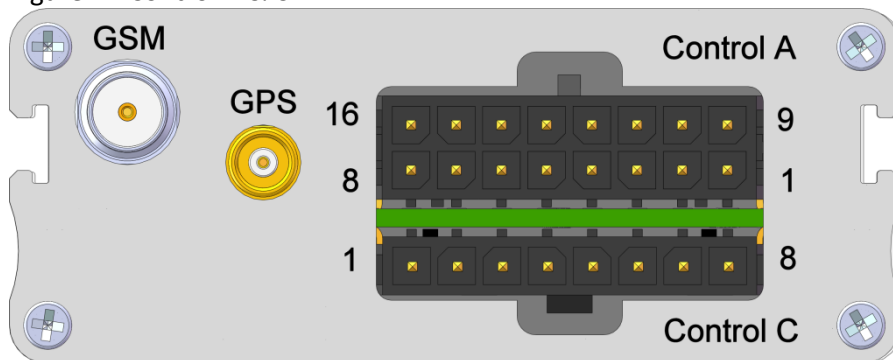


Table 1 - Control A pinout

Pin #	Name	Description
1	VIN+	12-36V DC input
2	VIN-	Power ground
3	AUXAlarm	Auxiliary alarm input
4	AIN1	Analog input 1
5	VBATT	3.3-4.2V DC output
6	AIN2	Analog input 2
7	Bat+	External battery positive pole
8	RLIN	Relay input
9	Ignition	Ignition input
10	PBAlarm	Pushbutton alarm input
11	AUXCTRL	Auxiliary control input
12	PRV	Privacy input
13	GND	Signal ground
14	VSAAlarm	Vibration sensor input
15	Bat-/GND	External battery negative pole/Signal ground
16	RLOUT	Relay output

Table 2 - Control C pinout

Pin #	Name	Description
1	Mic+	Microphone input positive pole
2	Mic-	Microphone input negative pole
3	Spk+	Speaker output positive pole
4	Spk-	Speaker output negative pole
5	GSM Status	GSM Status output
6	GND	Signal ground
7	On/Off	On/Off input
8	VBATT	3.3-4.2V DC output

Control B

Control B is a 12-pin Microfit connector with two rows of six pins each.

Figure 2 - Control B pinout

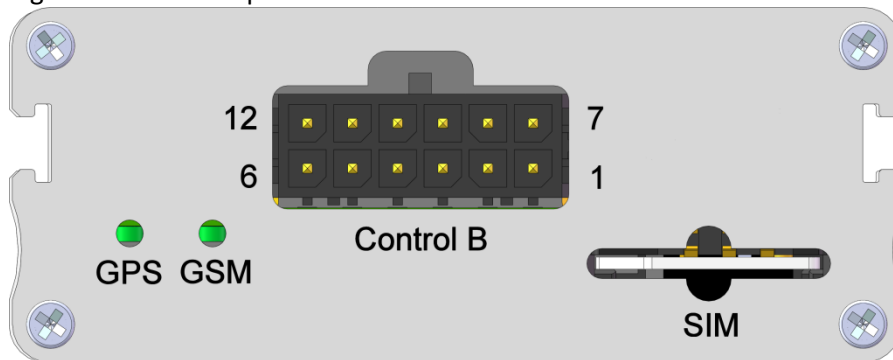


Table 3 - Control B

Pin #	Name	Description
1	VBATT	3.3-4.2V DC output
2	DBGMode	Reserved
3	On/Off	On/Off input
4	GND	Signal ground
5	CT104	Reserved
6	CT106	Reserved
7	Mode	Reserved
8	IRAlarm	IR detector input
9	VBATT	3.3-4.2V DC output
10	TSAlarm	Temperature sensor input
11	CT103	Reserved
12	CT105	Reserved

Power

SRT Avant Fleet may be powered by a 12-36V DC power supply, an internal single-cell Li-Ion battery or an external battery.

If an external power source of 12-36 VDC is available, this must be connected to VIN+ and VIN- inputs.

If the unit is delivered with an internal battery, the external battery connector can't be used. Otherwise the external battery, which has to be equipped with a protection circuitry, must be connected to Bat+ and Bat- inputs.

When an external power source is available, charging of the battery, whether it is external or internal, is controlled by the software. The maximum charge current is 500 mA.

VBATT

The internal working voltage VBATT may vary between 3.3 and 4.2V DC depending on the power supply alternative used and the current battery status.

If an external power supply is used to power the unit, VBATT is fixed at 4.0V.

If the unit is running on battery power (no power supply connected or otherwise not used due to low power), VBATT follows the battery voltage, which should normally be between 3.3V and 4.2V DC.

AIN1/AIN2

These inputs can be used either as general purpose analog inputs or as analog alarm inputs. The permitted analog input signal level is 0-5V DC.

RLIN/RLOUT

RLIN and RLOUT are connected to input respective output of a relay inside the unit. The relay is controlled by software.

On SRT Avant Fleet X08, the relay is a MOSFET device and care is needed to connect external equipment correctly because there is no electrical isolation between the signal connected to relay and the equipment. On SRT Avant Fleet X09, the relay is an electromechanical device with electrical isolation. In both cases the relay is dimensioned for a current of 1A at 12-36 VDC.

AUXAlarm and PBAAlarm

These inputs can be used either as general purpose digital inputs or as digital alarm inputs.

They can be configured either as normally closed inputs or as normally open inputs when used for alarm purposes.

For closed condition, the input must be connected to GND. For open condition the input must be left floating.

VSAAlarm

Depending on the hardware configuration the product comes with at delivery upon customer request, this input can be used in two different ways.

The first option is that VSAAlarm input operates precisely in the same way as AUXAlarm and PBAAlarm inputs.

The second option is that this input is not available for external connection and used for an internal vibration sensor circuit type MS24M manufactured by Assemtech.

IRAlarm

This input signal is intended to be used with an infrared motion detector sensor circuit type Napion AMN1 with digital output manufactured by Panasonic. Such a sensor requires three connections: digital output, power supply and ground. If your application requires such an IR sensor, connect the digital output of the sensor to this input. The power supply and ground leads of the sensor should be connected to VBATT and GND respectively.

Privacy

This input is a general purpose digital input. Under software control it can be used to enable/disable privacy mode to prevent that SRT Avant Fleet transmits GPS information if privacy mode is enabled.

This input is a normally closed input, i.e. it is off when it is connected to ground and on when it is floating.

IGN and AUXCTRL

The IGN input can be used as a general purpose digital input or as a digital input of which the on time can be measured or as a tool to control the GSM/GPS operation of SRT Avant Fleet.

The AUXCTRL input can be used as a general purpose digital input or as a digital input of which the on time can be measured.

They are active high inputs, i.e. they are off when they are floating and on when they are connected to a signal of 12-36V DC.

TSAlarm

This input signal is intended to be used with a temperature sensor circuit type DS18B20 manufactured by Maxim.

Such a sensor requires three connections: IO, power supply and ground.

If your application requires such a temperature sensor, connect the IO lead of a DS18B20 to this input. The power supply and ground leads of the sensor should be connected to VBATT and GND respectively.

On/Off

This input signal is intended to be used to turn the unit on or off without cutting the power supply. If this signal is left open, the unit is off. To turn the unit on, this signal must be connected to VBATT.

Mic+/Mic-

The Mic+ and Mic- inputs are differential microphone inputs. They already include the convenient biasing for an electret microphone so that such a microphone can be directly connected on those inputs.

Spk+/Spk-

The Spk+ and Spk- outputs are differential speaker outputs. They can drive a load resistance of down to 8 ohm.

GSM Status

This signal is identical to the signal which is used to drive the internal GSM status LED. If the customer needs to have an external LED to display the GSM status, this signal may be used. For help about how to connect an external LED to this input, the customer needs to contact Scandinavian Radio Technology AB.

RF interface

GSM RF connection

The integrated GSM antenna connector of the SRT Avant Fleet is a SMA connector.

The SMA connector incorporates a "screw-on" latching action in order to make the connection secure with an excellent RF performance. The characteristic impedance of SMA coaxial connector is 50Ω.

The antenna must fulfill the following requirements:

	GSM 850	E-GSM 900	DCS 1800	PCS 1900
Frequency RX	869-894MHz	925-960MHz	1805-1880MHz	1930-1990MHz
Frequency TX	824-849MHz	880-915MHz	1710-1785MHz	1850-1910MHz
Impedance	50Ω			
VSWR	<2			
Typical radiated gains	0dBi in one direction at least			

The antenna cable and connector should be chosen in order to minimize losses in the frequency bands used for GSM 850 (850MHz), E-GSM 900 (900 MHz), DCS 1800 (1800 MHz) and PCS 1900 (1900 MHz). 0.5dB can be considered as a maximum value for loss between the module and an external connector.

GSM RF performance

RF performances are compliant with the ETSI recommendation 05.05 and 11.10.

GPS RF connection

The integrated GPS antenna connector of the SRT Avant Fleet is a MCX connector. The MCX connector incorporates a "plug-in" latching action. The characteristic impedance of the MCX coaxial connector is 50Ω.

The GPS receiver requires a 3 VDC active antenna to receive the GPS satellite signals and pass them to the receiver. The GPS signals do not penetrate conductive or opaque surfaces and because of this the antenna must be located outdoors with a clear view of the sky.

Indicators

The GSM status and GPS status indicators are supported by SRT Avant Fleet.

The GSM status lamp is located at the corner and the GPS status between it and the connector.

These lamps can be ON, OFF or FLASHING to indicate the operating status of the unit:

GSM Status

ON: The unit is powered but is not functional due to a problem with SIM card or network coverage.

FLASH: The unit is functional and registered.

OFF: The unit is not powered.

GPS Status

FLASH: GPS is ON, functional and supplies position information.

OFF: GPS is OFF or signal conditions are so bad that it doesn't supply position information.