

# iQ-Radio S4-BT



# Contents

- 1. Description.....3
- 2. Technical specifications different models .....3
- 3. General specifications .....4
- 4. What is in the box .....4
- 5. Hardware installation .....5
- 6. How to send SL commands to the modem .....5
- 7. SL commands .....6
- 8. Dimensions .....7
- 9. Warranty.....8
- 10. Disclaimer .....8

## 1. Description

iQ-Radio has built the modular iQ-Sx telemetry platform. Manufactured to compliment your application. Based on past experience as well as future requirements we listen to customer requirements in various markets to hear and learn about the wishes and demands. With our modular design and flexibility in using your desired interfaces we supply telemetry solutions ranging from UHF to Cellular up to Wi-Fi p, Wi-Fi and Bluetooth.

## 2. Technical specifications different Models

### **iQ-S4-BT**

The iQ-S4 is a UHF wide band telemetry transceiver operating the frequency band 403-473 MHz. This compact telemetry platform finds its use in multiple applications such as GNSS, ITS, Offshore, Water and Grid Monitoring, building automation, wireless monitoring and access control systems, remote controlled vehicles, remote digital signage, etc. The equipment complies with the following international standards: EN 300 113-2 Annex A, EN 301 489-1,-5, EN 60950-1 and FCC CFR47 Part 90.

#### Technical specifications iQ-S4-BT

Frequency	403 ... 473 MHz
Channel Width	12.5 kHz/25 kHz (software selectable)
Tuning Range	70 MHz
Frequency Control	Synthesized 6.25 kHz tuning resolution
Modulation	4FSK, 8FSK, 16FSK, GMSK
Carrier Power	100, 200 , 500, 1000 mW (programmable)

### **iQ-S4-OA**

The iQ-S4 OA is the newest KAR modem for the Dutch ITS market. The iQ-S4 OA KAR Modem fulfils the Dutch Open Air protocol standard. By using narrow band telemetry radio we provide bus companies and local governments with a safe wireless network. The equipment complies with the following international standards: EN 300 113-2 Annex A, EN 301 489-1,-5, EN 60950-1 and FCC CFR47 Part 90.

#### KORTE AFSTAND RADIO (KAR)

The KAR Specification defines how on-board computers can be used for various data communication applications within public transportation. It focuses mainly on systems and components used for a set of applications developed to enhance the control and flow of public transportation as well as information services to the public. The applications are based on a combination of up-to-date technologies, including on-board computers, GPS positioning, and short-range wireless communication with radio modems.

#### Technical specifications iQ-S4 OA

Frequency	403 ... 473 MHz
Channel Width	12.5 kHz/25 kHz (software selectable)
Tuning Range	70 MHz
Frequency Control	Synthesized 6.25 kHz tuning resolution
Modulation	OA (KAR protocol, "Korte Afstand Radio")
Carrier Power	20, 50, 100, 200, 500, 1000 mW (programmable)

### 3. General specifications

#### DATA MODEM

Interface	RS-232, optional Bluetooth and UDP
Interface connector	DB9, female, RJ45 female
Data speed of serial interface	1200-115200 bps
Data speed of radio interface	9600, 14400, 19200, 28800 bps
Data format	Asynchronous data
Air interface encryption	AES128 (optional)

#### GENERAL

Input Voltage	9-30 Vdc / 1A
Power Consumption	Typical 0.8 W (receive) 4.7 W (transmit 1W)
Temperature Range	-25 °C ... +55 °C
Antenna connector	TNC, 50 ohm, female
Construction	Diecast aluminium alloy
Size HxWxD mm	115 x 64 x 31 mm
Weight	250 g

### 4. What is in the box

- 1x iQ-Radio modem
- 1x straight serial DB9 cable (male / female)
- 1x DC power cable

## 5. Hardware installation

Connect a suitable antenna with a coax cable (impedance 50 ohm) to the antenna connector of the iQ-Radio.

Connect a PC via the supplied serial DB9 cable to the iQ-Radio.

Connect the power cable to a power source between 9-30 VDC

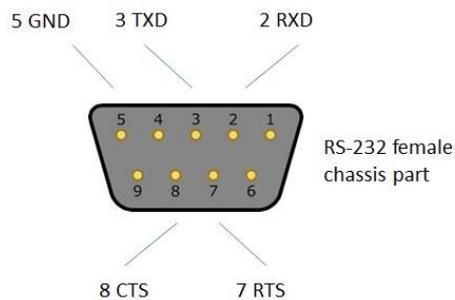
Connect the power connector to the iQ-Radio

The iQ-Radio can now be programmed with “SL commands” via a terminal program.

The ethernet connector is for future use and inactive.



iQRadio  
view top side



iQRadio  
view bottom side



POWER CONNECTOR  
cabel part  
(Wurth# 691343710002)

+Vdc      GND

## 6. How to send SL commands to the modem

Use a terminal program e.g. Satels **SaTerm** witch can issue SL commands as macro's.

[https://www.satel.com/wp-content/uploads/2017/02/SaTerm\\_sw\\_v4\\_3\\_5.zip](https://www.satel.com/wp-content/uploads/2017/02/SaTerm_sw_v4_3_5.zip)

Another terminal program that can be used is **Terminal**

<https://sites.google.com/site/terminalbpp/>

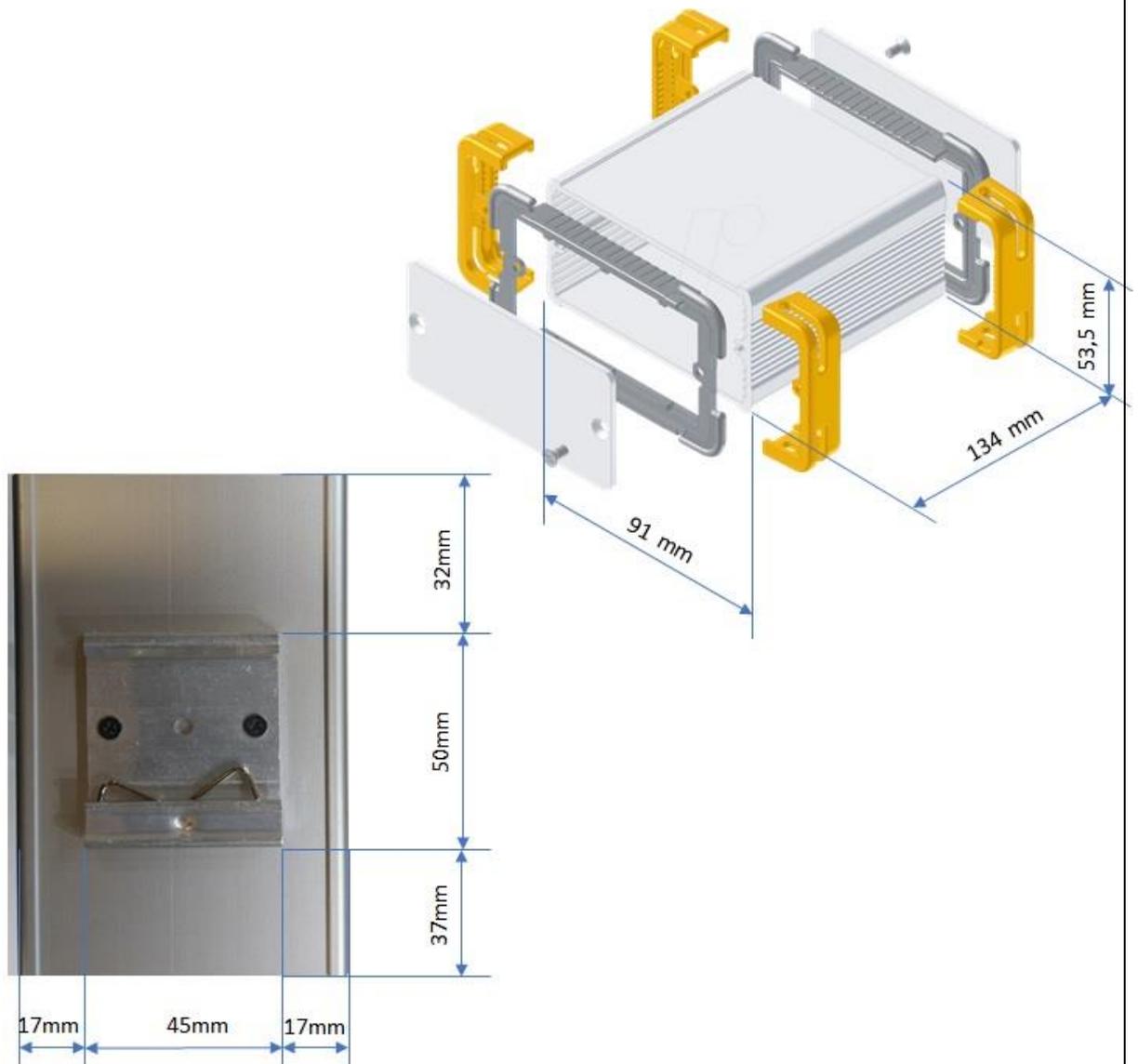
The default serial speed for the iQ-S4-OA is 9600 bps

The default serial speed for the iQ-S4-BT is 115200 bps

## 7. SL commands

Commando	Omschrijving	Response
SL%B?	Get serial data parameters	baud rate, character length, parity, number of stop bits (for example "38400, 8, N, 1")
SL%B=a,b,c,d	Set serial data port parameters. a= "115200", "57600", "38400", "19200", "9600", "4800", "2400" or "1200" (defines baud rate) b="8" (defines character length) c= "N", "O" or "E" (defines parity) d= "1" (defines number of stop bits)	"OK" or "ERROR"
SL**>	Save current settings as permanent settings	"OK" or "ERROR"
SL*R>	Restore settings to their factory set values	"OK" or "ERROR"
SL!H?	Get radio HW info	"HW:nnnnn"
SL!V?	Get modem "type"	Depending on variant, for example "3AS modem"
SL%D?	Get Modem Type	Depends on model, for example "SATELLINE-3AS"
SL%H?	Get logic hardware version	Hardware info
SL%S?	Get Serial Number	Serial number of radio modem
SL%V?	Get firmware revision information	For example "3.39"
SL&F?	Get active frequency	"nnn.nnnnn MHz"
SL&F=nnn.nnnnn	Set active frequency to nnn.nnnnn MHz	"OK" or "ERROR"
SL&FR?	Get Rx frequency	"nnn.nnnnn MHz"
SL&FR=nnn.nnnnn	Set Rx frequency to nnn.nnnnn MHz	"OK" or "ERROR"
SL&FT?	Get Tx frequency	"nnn.nnnnn MHz"
SL&FT=nnn.nnnnn	Set Tx frequency to nnn.nnnnn MHz	"OK" or "ERROR"
SL&W?	Get channel spacing/channel width	"25.0 kHz", "12.5 kHz", "6,25 kHz" or "20.0 kHz"
SL&W=xxxx	Set channel spacing. Value of xxxx is: "625" for 6,25kHz "1250" for 12,5 kHz "2000" for 20 kHz "2500" for 25 kHz Command is supported only by hardware variants with adjustable channel spacing Before using this command, make sure that active frequency matches new channel spacing	"OK" or "ERROR"
SL@D?	Get Tx delay (ms)	For example "0 ms" or "50 ms"
SL@D=n	Set Tx delay (ms), n is [0...65535]	"OK" or "ERROR"
SL@E?	Get supported radio compatibility modes.	List of numbers, separated by commas, showing the supported modes: 0=Satel3AS, 1=PacCrest 4FSK, 2=PacCrest GMSK, 3=Trimtalk, 4=Trimtalk Trimble, 5=PCC FST For example: "0,1" indicates that the modem supports Satel3AS and PacCrest 4FSK protocols.
SL@F?	Get noise level of radio channel	"-xxx dBm"
SL@M?	Get repeater function	"O" = Repeater OFF(character O) "R" = Repeater ON
SL@M=x	Set repeater function. Values of x are: "O" = Repeater function OFF(character O) "R" = Repeater function ON	"OK" or "ERROR"
SL@P?	Get transmitter output power	One of these values "100mW", "200mW", "500mW", "1000 mW"
SL@P=nnnnn	Set RF output power (mW) For example "SL@P=100" sets 100 mW transmitter output power. "100" sets 100 mW transmitter output power. "200" sets 200 mW transmitter output power. "500" sets 500 mW transmitter output power. "1000" sets 1000 mW transmitter output power.	"OK" / "ERROR"
SL@R?	Get RSSI (Received Signal Strength Indication) of last received message (dBm)	"-nnn dBm", nnn is a decimal value of field strength between -80 dBm and -118 dBm. Value is available 7 s after reception, after that the response is "<-118 dBm". SATELLINE-3AS Epic returns the stronger value of two receivers.
SL@S?	Get radio compatibility mode	"0" = Satel 3AS "1" = Option 1 (PacCrest 4-FSK) "2" = Option 2 (PacCrest GMSK) "3" = Option 3 (TrimTalk GMSK) (Rx fits PacCrest modems) "4" = Option 4 (TrimTalk GMSK) (Rx fits Trimble modems) "5" = Option 5 (PacCrest FST)
SL@S=x	Set radio compatibility mode. Value of x is: 0 = Satel 3AS 1 = Option 1 (PacCrest 4-FSK) 2 = Option 2 (PacCrest GMSK) 5 = Option 5 (PacCrest FST)	"OK" or "ERROR"
SL@T?	Get current signal threshold (dBm)	"-nnn dBm" (for example "-80 dBm" or "-112 dBm")
SL@T=-nnn	Set minimum power level of signal to be received (=Signal Threshold level) Value of nnn is decimal value [80...118] in dBm	"OK" or "ERROR"
SL@X=n	Reset command. Values of n are: "9" Reset modem	"OK" or "ERROR", then modem resets required blocks.
SL+T=n	0 = Set test off 1 = Set Carrier test on 2 = Set Carrier test modulated on	"OK" or "ERROR"

## 8. Dimensions



## 9. Warranty

Our products are warranted for 12 months from date of purchase against faulty materials and workmanship. Should any fault occur the unit should be returned to Satel Benelux, freight pre-paid. Please include a brief fault description to assist with prompt return. Unauthorized alterations or repairs will invalidate the warranty.

## 10. Disclaimer

All information in this document is carefully prepared and offered in good faith as a guide in the product installation, use and servicing. Installers must ensure that the final installation operates satisfactorily within the relevant regulatory requirements. We accept no responsibility for incorrect installation. We reserve the right to change products, specifications, and installation data at any time, without notice.