	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	1 of 11
	Concerning	Doc. No.	Rev.	Date
	Features and How to set parameters		1.01	29. 01. 2018

Operation Manual

ST20B Vehicle Information Device

Suntech International Ltd.



	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	2 of 11
	Concerning	Doc. No.	Rev.	Date
	Features and How to set parameters		1.01	29. 01. 2018

Table of Contents

1. Introduction	4
2. Overview	4
2-1. Parameter change	4
2-2. Features	4
3. Device Pinout & Wiring Color Code	5
3-1. Device Pinout	5
3-2. Serial Connection Options	5
3-2-1. Pigtail Cable Adapter for RS232 connection to Tablet	5
3-2-3. BLE Connection Mode	5
3-3. Cable adapter for RS232 to Telematics Box	6
3-4. Cable adapter for connection to vehicle	6
3-4-1. J1939 Type I Cable	6
3-4-2. J1939 Type II Cable	6
3-4-3. J1708 Cable	6
4. Device Functionality	7
4-1. Indication with LED	7
4-1-1. Red LED for CAN Data	7
4-1-2. Blue LED for Bluetooth connection.....	7
4-2. Power Saving	7
5. Commands	8
5-1. Version	8
5-2. CAN Baud rate	8
5-3. Vehicle Protocol	8
6. Report	9
7. Supported Accessories	9
Revisions	9

	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	3 of 11
	Concerning	Doc. No.	Rev.	Date
	Features and How to set parameters		1.01	29. 01. 2018

Disclaimer

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Warning

Our customers are required to be aware that connecting the wire inputs can be hazardous to both of the installer and your vehicle's electrical system(s) if not done by an experienced installer. This document assumes you are aware of the inherent dangers of working in installing the device on the vehicle(s) and the machinery.

Document Amendments

When it comes to the firmware version column with specific firmware number, any amendment(s) on the comments column should be made on this relevant firmware version (and the versions thereafter). Before applying any changes made in this protocol, you are required to make sure that you have upgraded the firmware suitable for the specified version.

	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	4 of 11
	Concerning	Doc. No.	Rev.	Date
	Features and How to set parameters		1.01	29. 01. 2018

1. Introduction

ST20B

The ST20B is an ELD device. It is designed to collect data through the vehicle diagnostic connector, and interact with a connected tablet.

Please note that this Operation Manual is for the standard model. In case specific requirements are incorporated into this Manual, such a manual applies only for the case.

2. Overview

Main function of device installed on a vehicle is to report vehicle data required for ELD.

2-1. Parameter change

Parameters which have already been set on the device can be changed via RS232 connected with PC if a user needs to do so. Some controlling functions can also be implemented in the same way.

- 9600bps, No parity, 8bit Data, Stop bit 1

2-2. Features

Key features of the ST20B device are as follows:

- Power Saving Modes (Power Down Modes)

- LED Indicators

The LEDs indicate whether or not the CAN communication is available from the vehicle

- I/O Lines

Device has:

- 1 Output line
- 1 Input lines
- 1 Ignition Output line
 - Ignition status is detected by the CAN data

- Upgrading Firmware

In case 'firmware' of the device has an (some) error(s) or needs to be upgraded to provide the user with newly implemented services, the device can upgrade its internal ROM file by RS232 connection.

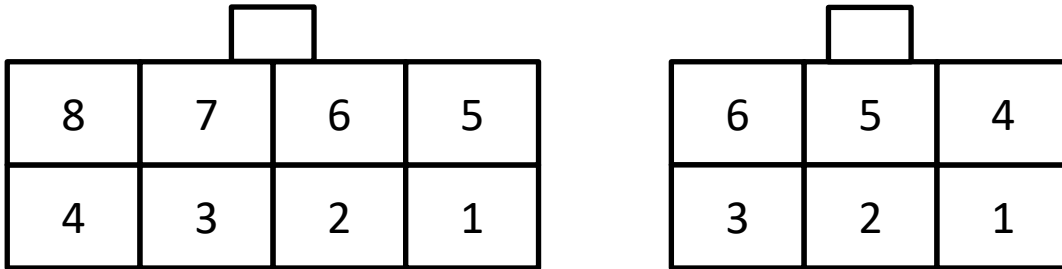
Over the air (OTA) updates will need to be handled by the device the ST20B is connected to, either a tablet or telematics box.

RS232 baud rate is 115200 bps for upgrading firmware.

3. Device Pinout & Wiring Color Code

3-1. Device Pinout

Device Connector when looking into the device:



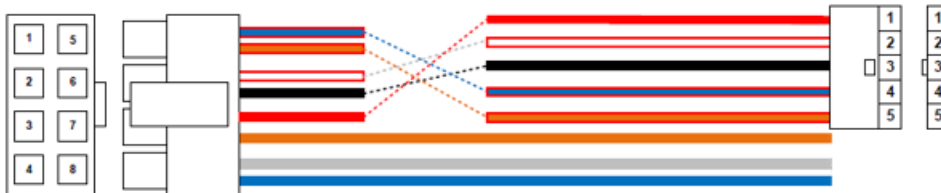
Connection Table:


Pin Number	Connector	Description
1	8-pin	RS232 Receive (RX) Line Communication to the device
2	8-pin	Ground
3	8-pin	Output
4	8-pin	Input
5	8-pin	RS232 Transmit (TX) Line. Communication from the device
6	8-pin	Enable
7	8-pin	Power
8	8-pin	Ignition Output
1	6-pin	Ground
2	6-pin	CAN Low
3	6-pin	J1708 -
4	6-pin	Power
5	6-pin	CAN High
6	6-pin	J1708 +

3-2. Serial Connection Options

3-2-1. Pigtail Cable Adapter for RS232 connection to Tablet

This Pigtail is used to allow the RS232 to Adnroid conversion cable to be directly connected to the ST20B device



	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL Concerning	M. HEIDA	HB Lee	6 of 11
	Features and How to set parameters	Doc. No.	Rev.	Date
			1.01	29. 01. 2018

3-2-3. BLE Connection Mode

ST20B can communicate with the tablet using BLE communication.

3-3. Cable adapter for RS232 to Telematics Box

3-4. Cable adapter for connection to vehicle

3-4-1. J1939 Type I Cable

9-pin vehicle cable



3-4-2. J1939 Type II Cable


9-pin vehicle cable



3-4-3. J1708 Cable

6-pin vehicle cable



	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	7 of 11
	Concerning	Doc. No.	Rev.	Date
	Features and How to set parameters		1.01	29. 01. 2018

4. Device Functionality

4-1. Indication with LED

RED LED indicates status of J1708 or CAN data.

4-1-1. Red LED for CAN Data

GPS	Blink Count	Description
CAN Available	1	Blink every 200ms
CAN Not Available	2	On for 3s, then Off

4-1-2. Blue LED for Bluetooth connection


	Blink Count	Description
Connection	2	Blink every 500ms
Disconnection	It's Not Blink	It's Not Blink

4-2. Power Saving

If ST20B can receive vehicle data like as SPEED, RPM and so on via J1939 or J1708 interface, the vehicle is in driving. In this case, ST20B will communicate with the tablet and enable charging the battery of the tablet via RS232 cable. RS232 cable has red colored LED indicator and it will be turned on.

If ST20B cannot receive any data from the vehicle over 3 seconds, it is considered that the engine of vehicle is turned off. In this case, ST20B will enter the Low-power mode to prevent exhausting vehicle battery. In the Low-power mode, charging battery and communication will be stopped via RS232 cable. Also, LED indicator of RS232 will be turned off.

If ST20B receives vehicle data in Low-power mode, it will do wakeup and restart communication and charging tablet.

	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	8 of 11
	Concerning	Doc. No.	Rev.	Date
	Features and How to set parameters		1.01	29. 01. 2018

5. Commands

All command and response string is ended with CR/LF characters.

5-1. Version


CMD	Value	Description
\$REQVER		Request version info of the firmware
Read firmware version [Command] \$REQVER [Response] \$REQVER: ST20B_USA_STADV_001		

5-2. CAN Baud rate

CMD	Value	Description
\$CAN_BAUD		Get the current value of CAN baud rate
\$CAN_BAUD	250 or 500	Set baud rate to 250 or 500 kbps Default value is 250.
Read current setting of CAN baud [Command] \$CAN_BAUD [Response] \$CAN_BAUD:250 kbps Set CAN baud to 250kbps [Command] \$CAN_BAUD=250 [Response] \$CAN_BAUD:250 kbps Set CAN baud to 500kbps [Command] \$CAN_BAUD=500 [Response] \$CAN_BAUD:500 kbps		

5-3. Vehicle Protocol

CMD	Value	Description
\$V_PROT		Get the current value of vehicle protocol
\$V_PROT	1~3 1: J1939 only 2: J1708 only 3: Auto (J1939 then J1708)	Set vehicle protocol between J1939 and J1708. Default value is 3.
Read current setting of vehicle protocol [Command] \$V_PROT [Response] \$V_PROT:3 Set vehicle protocol to "J1939 only" [Command] \$V_PROT=1 [Response] \$V_PROT:1 note) 3 (Auto) : ST20B report contains only one vehicle protocol. J1939 has higher priority. If vehicle data like as SPEED or RPM can be read from J1939, report will be made based on J1939. If J1939 is unavailable, then ST20B will try to read J1708.		

	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	9 of 11
	Concerning	Doc. No.	Rev.	Date
	Features and How to set parameters		1.01	29. 01. 2018

6. Report

ST20B generates report via RS232 port with 3 seconds interval.
It starts with driving time field and ESN.

e.g.)

[00:00:20]

ESN: 123456789

VIN: 1M8GDM9AXKP042007

SPEED: 20.08 km/hr

ODOMETER: 400.00 km

ENGINE HOURS: 100.00 hr


RPM: 642.50 rpm

7. Supported Accessories

Revisions

Rev. No.	Date	Modifications were made on:	Writer
1.01	17-06-29	Add Commands and Report	JW Park

- End of the Document -

	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	10 of 11
	Concerning	Doc. No.	Rev.	Date
	Features and How to set parameters		1.01	29. 01. 2018

FCC Statement to the User

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
3. Increase the separation between the equipment and receiver.
4. Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.


This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with FCC RF exposure compliance requirements, please follow operation instructions as documented in this manual.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body. The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

	Doc. Title	Author		Page of Pages
	ST20B OPERATION MANUAL	M. HEIDA	HB Lee	11 of 11
Concerning	Doc. No.	Rev.	Date	
Features and How to set parameters		1.01	29. 01. 2018	

Canada Compliance

RF Radiation Exposure Statement

This device must be installed in a location where the antennas of the device will have a minimum distance of at least 20 cm from all persons. Using higher gain antennas and types of antennas not certified for use with this product is not allowed. The device shall not be co-located with another transmitter.

Le dispositif doit être placé à une distance d'au moins 20 cm à partir de toutes les personnes au cours de son fonctionnement normal. Les antennes utilisées pour ce produit ne doivent pas être situés ou exploités conjointement avec une autre antenne ou transmetteur.

Industry Canada Notice and Marking

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.