Display DS20 - user’s guide

Simplified Declaration of Conformity

The simplified EU declaration of conformity referred to in Article 10(9) shall be provided as follows:
Hereby, Suzhou Wanjia Electric Co., Ltd declares that the radio equipment BLE Display is in compliance with Directive 2014/53/EU.

Address: #157 West Shihu Road Suzhou China

This product does NOT contain the substances restricted by the RoHS legislation at levels over the maximum concentration values.
This product is fully CE certified, it also includes EMC certification.
This product can be used across EU member states.
Technical information about display DS20

1. Part No.: DS20
2. Type: SIDE LCD DISPLAY
3. Environmental regulation: RoHS
4. Essentials:

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>CHARACTERISTICS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>36.0V</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20 ~ 40 deg C</td>
<td>15 ~ 75% RH</td>
</tr>
<tr>
<td>Bluetooth Operation Frequency</td>
<td>2.4~2.48 GHz</td>
<td></td>
</tr>
<tr>
<td>Bluetooth Transmit Power</td>
<td>1dBm Typ.</td>
<td></td>
</tr>
</tbody>
</table>

5. Waterproofing level: IP65
6. Handle diameter:
   - Control part ≥22.2mm
   - * Suggested torque limit for assembly: 0.6 N.m (Including the bolt for preventing slip off)

7. LCD view angle (Cr ≥1.5):
   - Direction of 12 o'clock, 40 degree
   - Direction of 6 o'clock, 55 degree
   - Direction of 3 o'clock, 50 degree
   - Direction of 9 o'clock, 50 degree
Display DS20

DS20 is an LCD side display providing standard functions of controlling the ebike. Except this the additional functions are included such as Shifting Calibration or Shifting Parameters. This user’s guide explaining both the basic and additional features.

Main Screen overview and control buttons

- Characteristic of the control buttons

To operate DS20 the controller must be described first. DS20 is equipped with 5 integrated buttons. See description below:

- **Power** button turns ON and Off the ebike.
- The + and - buttons are used to cycle through menus, change values in settings. They are used to set the level of assistance.
- **Mode** button changes displaying of different values and functions on main screen.
- **Walk** button to decrease or increase the brightness of display.

- Characteristic of the display

Battery status
Actual Speed
Assistance Level
Symbols
Various information - such as Average Speed, Pedalling Cadence, etc.
8.1. Operating DS20

8.1.1. Start UP - Turn Off

Press POWER button for a longer period of time to start the system. The display turns on and several information is shown. To turn the system Off press POWER button for a longer period of time once again. In case there is no activity longer than 5 minutes the system shuts down itself.

8.1.2. Support level adjustment

The support level is changed by pressing the + or - button. There are 6 assistance levels. These are 0 assistance, 1, 2, 3, 4 and 5 assistance. When there is no bar highlighted (1, 2, 3, 4, 5) the 0 assistance is selected. The 0 level means no motor support.

8.1.3. TRIP, ODO, AVG, MAX, CAD modes

Press MODE(i) button shortly to switch different modes. Press MODE(i) button repeatedly to cycle through different modes.

- ODO - The distance ever travelled
- AVG - average speed reached
- MAX - maximum speed reached
- CAD - pedalling cadence
- TRIP - The distance travelled during the journey

Note: once you are in a TRIP mode by pressing MODE button for a longer period of time the TRIP information is reset to zero.

8.1.4. Display brightness

Press + button for a longer period of time to increase or decrease the backlight brightness of the display.
8.1.5. Walk support

To use WALK support press MODE(i) button once and shortly then immediately press and HOLD WALK button. While holding WALK button the e-bike is in the WALK support mode. This is also notified by a walker.

8.2. Settings

The Settings contains several submenus allowing setting up some features as described below. To enter SETTINGS press MODE(i) and - buttons together for a longer period of time. To leave SETTINGS press MODE(i) for a longer period of time once again.

8.2.1. BLG - LCD Backlight

This feature allows to set up the intensity of backlight. The value of backlight has 5 levels.
Press **MODE(i)** button shortly to activate the **Backlight** setting. Press the + or - button to change current value of LCD Backlight.

Press **MODE(i)** for a longer period of time to confirm the value of **BLG - LCD Backlight**.

### 8.2.2. Other settings

- Display soft version
- Display boot version
- Controller soft version
- Controller boot version
## 9. Error indication on display

<table>
<thead>
<tr>
<th>Error code</th>
<th>Appearance</th>
<th>Description</th>
<th>Advice for user</th>
<th>Advice for after-sales service</th>
</tr>
</thead>
</table>
| 0x90       | Appearance | Motor output stopped | - Done by user  
- a. Pedal reverse  
- b. Turn e-bike OFF/ON  
- Visit the nearest after-sales service | - Check “Done by user” routine again  
- Change torque sensor  
- Change motor controller unit  
- Change motor controller unit and torque sensor |
| 0x11       | Appearance | Motor output stopped | - Done by user  
- a. Pedal reverse  
- b. Turn e-bike OFF/ON  
- Visit the nearest after-sales service | - Check “Done by user” routine again  
- Change torque sensor  
- Change motor controller unit  
- Change motor controller unit and torque sensor |
| 0x92       | Appearance | Cadence mode appears on the display | - Visit the nearest after-sales service | - Change torque sensor  
- Change motor controller unit  
- Change motor controller unit and torque sensor |
| 0x13       | Appearance | Report error only | - Visit the nearest after-sales service | - Change gearsensor |
| 0x15       | Appearance | Report error only | - Done by user  
- a. Adjust the position of speedsensor and steel magnet  
- Visit the nearest after-sales service | - Check “Done by user” routine again  
- Change speedsensor and adjust the position of speedsensor and steel magnet |
| 0x18       | Appearance | Motor output stopped | - Visit the nearest after-sales service | - Change cadence sensor |
| 0x20       | Appearance | Reduce motor output | - Done by user  
- a. Reduce assist level  
- Visit the nearest after-sales service | - Change motor controller unit |
| 0xA1       | Appearance | Motor output stopped | - Done by user  
- a. Turn off the system and wait for the motor cool down  
- Visit the nearest after-sales service | - Check “Done by user” routine again  
- Change motor controller unit |
<table>
<thead>
<tr>
<th>Error code</th>
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<th>Description</th>
<th>Advice for user</th>
<th>Advice for after-sales service</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x22</td>
<td>Appearance</td>
<td>- Reducemotor output</td>
<td>- Visit thenearest after-sales service</td>
<td>- Change motor controller unit</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>- Temperature sensor issue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0x25</td>
<td>Appearance</td>
<td>- Reduce motor output</td>
<td>- Done by user a.Reduce assist level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>- High temperature of the motor</td>
<td>- Visit thenearest after-sales service</td>
<td>- Change motor controller unit</td>
</tr>
<tr>
<td>0x32</td>
<td>Appearance</td>
<td>- Motor output stopped</td>
<td>- Done by user a.Reboot the system and check connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>- Lora communication error</td>
<td>- Visit thenearest after-sales service</td>
<td>- Change motor controller unit</td>
</tr>
<tr>
<td>0xA6</td>
<td>Appearance</td>
<td>- Motor output stopped</td>
<td>- Done by user a.Turn off the system and wait for the motor cool down</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>- Motor overheated</td>
<td>- Visit thenearest after-sales service</td>
<td>- Change motor controller unit</td>
</tr>
<tr>
<td>0xA7</td>
<td>Appearance</td>
<td>- Motor load default value</td>
<td>- Done by user a.Reboot the system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>- Motor internal flash error</td>
<td>- Visit thenearest after-sales service</td>
<td>- Change motor controller unit</td>
</tr>
<tr>
<td>0x80</td>
<td>Appearance</td>
<td>- Motor output stopped</td>
<td>- Done by user a.Turn e-bike OFF/ON b.Check the connection between display and motor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>- Motor communication issue</td>
<td>- Visit thenearest after-sales service</td>
<td>- Change display</td>
</tr>
<tr>
<td>0x01</td>
<td>Appearance</td>
<td>- Motor output stopped</td>
<td>- Done by user a.Turn e-bike OFF/ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>- Motor communication issue</td>
<td>- Visit thenearest after-sales service</td>
<td>- Change display</td>
</tr>
<tr>
<td>0x40</td>
<td>Appearance</td>
<td>- Motor output stopped</td>
<td>- Done by user a.Turn e-bike OFF/ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>- Motor issue</td>
<td>- Visit thenearest after-sales service</td>
<td>- Change display and motor controller unit</td>
</tr>
</tbody>
</table>
| 0x41 | Appearance | - Motor output stopped  
|      | Description | - Motor issue  
|      |             | - Done by user  
|      |             | a. Turn e-bike OFF/ON  
|      |             | - Visit the nearest after-sales service  
|      |             | - Check “Done by user” routine again  
|      |             | - Change motor controller unit  
| 0xC2 | Appearance | - Motor output stopped  
|      | Description | - Motor issue  
|      |             | - Done by user  
|      |             | a. Turn e-bike OFF/ON  
|      |             | - Visit the nearest after-sales service  
|      |             | - Check “Done by user” routine again  
|      |             | - Change motor controller unit  

<table>
<thead>
<tr>
<th>Error code</th>
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<th>Description</th>
<th>Advice for user</th>
<th>Advice for after-sales service</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x43</td>
<td>Appearance</td>
<td>Motor output stopped</td>
<td>- Done by user a. Turn e-bike OFF/ON b. Visit the nearest after-sales service</td>
<td>- Check “Done by user” routine again - Change motor controller unit</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Motor issue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0xD0</td>
<td>Appearance</td>
<td>Motor output stopped</td>
<td>- Done by user a. Turn e-bike OFF/ON b. Check if the battery connect well c. Visit the nearest after-sales service</td>
<td>- Check “Done by user” routine again - Update ebike information - Check cables condition - Change display - Change motor controller unit - Change battery - Change display, motor controller unit and battery</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Battery issue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0x51</td>
<td>Appearance</td>
<td>Motor output stopped</td>
<td>- Done by user a. Turn e-bike OFF/ON b. Charge for the ebike c. Visit the nearest after-sales service</td>
<td>- Check “Done by user” routine again - Update ebike information - Check cables condition - Change display - Change motor controller unit - Change battery - Change display, motor controller unit and battery</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Battery issue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0x52</td>
<td>Appearance</td>
<td>Motor output stopped</td>
<td>- Done by user a. Turn e-bike OFF/ON b. Visit the nearest after-sales service</td>
<td>- Check “Done by user” routine again - Change motor controller unit</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Motor issue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0xE0</td>
<td>Appearance</td>
<td>Motor output stopped</td>
<td>- Done by user a. Turn e-bike OFF/ON b. Visit the nearest after-sales service</td>
<td>- Check “Done by user” routine again - Update ebike information - Check cables condition - Change display - Change motor controller unit - Change battery - Change display, motor controller unit and battery</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Battery issue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0xE5</td>
<td>Appearance</td>
<td>Motor output stopped</td>
<td>- Done by user a. Turn e-bike OFF/ON b. Visit the nearest after-sales service</td>
<td>- Check “Done by user” routine again - Update ebike information - Check cables condition - Change display - Change motor controller unit - Change display and motor controller unit</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Display issue</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>