

DBox 5 operating as a meteorological control unit: Alarms

ALARM	DESCRIPTION
Anemometer fault	The anemometer measurement is constantly reviewed to ensure the correct operation. For safety reasons, if there is a fault in the anemometer reading, the DBox sends the fault to the TBox. Refer to section Troubleshooting [► 31].
Charger fault (only SP version)	The anemometer measurement is constantly reviewed to ensure the correct operation. For safety reasons, if there is a fault in the anemometer reading, the DBox sends the fault to the TBox. Refer to section Troubleshooting [► 31].

4.1.4.1. Alarm use cases

After explaining every situation separately, it is important to know that more than one alarm can occur simultaneously. Therefore, the table below has been created to clarify the behavior of the system in those scenarios.

NOTICE



The table below shows transitions between positions, not between stages.

Transitions explained in table WILL ONLY WORK when the tracker is in AUTO MODE.

As snow alarm, wind alarm and TBox communications alarm only work in AUTO MODE, if the tracker is in any other status (manual remote or local, emergency stop remote or local, NFC or Fault Stop), these transitions will not work.

PREVIOUS TRACKER POSITION	WIND SPEED	SNOW ALARM (HIGH LEVEL)	LOW BATTERY	COMMUNICATION LOSS	FINAL TRACKER POSITION
Tracking	<a m/s	OFF	OFF	OFF	Tracking
Tracking	>a m/s	X	X	X	Wind stow
Tracking	>c m/s	ON	OFF	OFF	Wind stow
Tracking	<c m/s	ON	OFF	OFF	Construction
Tracking	>c m/s	OFF	ON	OFF	Wind stow
Tracking	<c m/s	OFF	ON	OFF	Construction
Tracking	>c m/s	OFF	OFF	ON	Wind stow
Tracking	<c m/s	OFF	OFF	ON	Construction
Construction	WIND Alarm active	X	X	X	Construction
Construction	No WIND Alarm	ON	OFF	OFF	Construction

PREVIOUS TRACKER POSITION	WIND SPEED	SNOW ALARM (HIGH LEVEL)	LOW BATTERY	COMMUNICATION LOSS	FINAL TRACKER POSITION
Construction	No WIND Alarm	OFF	ON	OFF	Construction
Construction	No WIND Alarm	OFF	OFF	ON	Construction
Construction	No WIND Alarm	OFF	OFF	OFF	Tracking
Wind stow	WIND Alarm active	X	X	X	Wind stow
Wind stow	<b m/s (t>10')	OFF	OFF	OFF	Tracking
Wind stow	<b m/s (t<10')	OFF	OFF	OFF	Wind stow
Wind stow	<b m/s (t>10') & <c m/s	ON	OFF	OFF	Construction
Wind stow	<b m/s (t>10') & >c m/s	ON	OFF	OFF	Wind stow
Wind stow	<b m/s (t<10')	ON	OFF	OFF	Wind stow
Wind stow	<b m/s (t>10') & <c m/s	OFF	ON	OFF	Construction
Wind stow	<b m/s (t>10') & >c m/s	OFF	ON	OFF	Wind stow
Wind stow	<b m/s (t<10')	OFF	ON	OFF	Wind stow
Wind stow	<b m/s (t>10') & <c m/s	OFF	OFF	ON	Construction
Wind stow	<b m/s (t>10') & >c m/s	OFF	OFF	ON	Wind stow
Wind stow	<b m/s (t<10')	OFF	OFF	ON	Wind stow

KEY	
a	maximum threshold
b	minimum threshold
c	security threshold

NOTICE



System info

The transitions shown in the table above must be used for reference only. The values will depend on the type of structure and project.

5. Troubleshooting

5.1. DBox 5 alarms and non-nominal operation

DBOX ISSUE	WHERE	TEST AND SOLUTION
Local Emergency Stop	LOCAL	The emergency stop button may be pressed. Go to the DBox and check the button. If it is safe, release the button and send the command TBox Control with the app. The tracker will move when it receives a new message from the TBox. If the emergency stop button is not pressed, contact PVH support.
Charger Fault [SP version]	LOCAL	Contact PVH support.
Inclinometer Fault	LOCAL	There is a fault in the inclinometer. Check the inclinometer position on the tracker and verify if the inclinometer LED is flashing red*. • Inclinometer misposition: correctly set the DBox on the tracker. • LED flashing red: Contact PVH support. • LED solid red: Replace the inclinometer. If the error persists, contact PVH support. • LED off: Check if the DBox is powered. If it is powered, replace the inclinometer. If the error persists, contact PVH support. *Pending to be confirmed.
High temperature	LOCAL or REMOTE	Wait for the DBox to cool down.
Low temperature	LOCAL or REMOTE	Wait for the DBox to warm up.

DBOX ISSUE	WHERE	TEST AND SOLUTION
Wrong Direction Movement	LOCAL	Check that the DBox is well installed. If the inclinometer is correctly installed, connect to the DBox through the NFC application and select "Tilt reverse" and "Motor reverse". If the error persists, please contact PVH support.
Slow Motor Movement	LOCAL	There is a fault in the movement of the motor. - Discard mechanical faults: - If the motor is making noises without moving, there is a mechanical fault. - If the motor moves the structure slower than the nominal movement or making weird noises, there is a mechanical fault. If the error persists, contact PVH support.
Over-current Fault	LOCAL	There is an overcurrent in the DBox output. Read the tracker info with the app to check the current value "Max motor current". If you move the structure after the error, the overcurrent value will be lost. Overcurrent means that the motor is asking for too much current: - Verify there is nothing blocking the axis of the tracker. - Discard mechanical faults: - If the motor is making noises without moving, there is a mechanical fault. - If the motor moves the tracker slower than nominal, there is a mechanical fault. If the error persists, contact PVH support

DBOX ISSUE	WHERE	TEST AND SOLUTION
High Power Consumption	LOCAL	The consumption of the DBox is greater than 10 A for over 1 second. • Verify there is nothing blocking the axis of the tracker. • Discard mechanical faults: • If the motor is making noises without moving, there is a mechanical fault. • If the motor moves the tracker slower than nominal, there is a mechanical fault. If the error persists, contact PVH support
Low Battery [SP version]	LOCAL or REMOTE	Check if there are alarms active: • Charger Fault Alarm is active and battery level is 0%: contact PVH support. • There are not alarms active: Check the battery level • If the level is under 60%, wait for sun-charging the battery. • If the battery level is over 60%, contact PVH support.
Out of boundaries	LOCAL	The reading of the inclinometer is $> \pm 65^\circ$, so the tracker is out of boundaries. • Move the tracker using the capacitive buttons or the NFC app until it is within the range of motion. • When the tracker is in the right position, reset the DBox.
TBox communications Lost	LOCAL	Check if the TBox is powered. • The TBox is off: power the TBox and wait for the DBox to receive messages. • The TBox is powered: reset the DBox and wait for receiving messages. If the alarm persists in 10 minutes, contact PVH support.

DBOX ISSUE	WHERE	TEST AND SOLUTION
Defect: Secure Position	REMOTE	The tracker has been moved to Wind or Construction Stow position due to an alarm. See specific alarms in this table.
Remote Emergency Stop	REMOTE	The remote emergency stop has been sent manually from SCADA. BEFORE sending it back to AUTO, check why the emergency stop was sent and verify there is nothing blocking the tracker movement.
Outdated DBox data	REMOTE	Check if the DBox is powered. • If the DBox is off, check the power supply (battery or AC power) • If the DBox is powered, reset the DBox. If after the reset the error persists within the next 3 hours, contact PVH support.

5.2. Self-powered DBox 5 troubleshooting

PROBLEM	CAUSE	SOLUTION
Tracker is stopped	An alarm has stopped the movement.	Read the tracker info with the Tracker Control Application to locate the alarm and refer to Alarms and notifications [► 24].
DBox does not update its information- Alarm OutdatedDBoxData	DBox is out of network or off.	Read the tracker information to check the battery level and the DBox status to know if the DBox is powered. • If the DBox is off (Low Battery level) waits for sun-charging. • If the battery level is normal and the DBox is powered, reset the DBox. If after the reset the error persists within the next 3 hours, contact PVH support.

PROBLEM	CAUSE	SOLUTION
Tracker is stopped in stow position	The tracker does not have a nominal status.	Read the tracker information and check the status: • The status is Defect: TBox Communications Lost: Check if the TBox is powered. • The TBox is off: power the TBox and wait for receiving messages in the DBox. • The TBox is powered: reset the DBox and waits for receiving messages. • The status is Defect: Secure Position. Refer to Alarms and notifications [► 24] and DBox 5 alarms and non-nominal operation [► 31]. If the alarm persists, contact PVH support.
DBox ignores orders from TBox	DBox is on Local manual mode (buttons or NFC mode).	Touch both buttons at the same time to set the TBox control OR place the phone on the NFC tag and send the "TBox Control" command. The structure will start to move when receives a new message from the TBox.
	DBox is off.	Power the DBox and check the battery level. If the alarm persists, contact PVH support.
	DBox lost TBox communications.	Read the DBox information with the app and reset if there is a loss of communications. If the problem persists, contact PVH support.
Buttons are not working	Buttons are disabled.	Press the emergency stop button and then release it. It will activate the buttons for 10 minutes.

PROBLEM	CAUSE	SOLUTION
Buttons are not working	Battery level may be low.	Read the tracker info with the PVH app and check the battery level. If the status is NOT "low battery", try to move with the NFC app: • The tracker moves with the app: Contact PVH support. • The tracker does not move with the app either: Check the motor cable and connection.
Red screen appears in App, "Error", it does not connect to the DBox.	NFC misconnection.	Move the phone closer to the NFC tag again. Try to face the NFC tag with the phone's NFC antenna. If the problem persists, try the connection with another DBox. If the problem persists, try with another phone. Then, contact PVH support.

5.3. Externally powered DBox 5 troubleshooting

PROBLEM	CAUSE	SOLUTION
DBox does not update its information- Alarm OutdatedDBoxData	DBox is out of network or off.	Read the tracker information to check the battery level and the DBox status to know if the DBox is powered. • If the DBox is off (Low Battery level) waits for sun-charging. • If the battery level is normal and the DBox is powered, reset the DBox. If after the reset the error persists within the next 3 hours, contact PVH support.
Tracker is stopped	An alarm has stopped the movement.	Read the tracker info with the Tracker Control Application to locate the alarm and refer to Alarms and notifications [► 24].

PROBLEM	CAUSE	SOLUTION
Tracker is stopped in stow position	The tracker does not have a nominal status.	Read the tracker information and check the status: • The status is Defect: TBox Communications Lost: Check if the TBox is powered. • The TBox is off: power the TBox and wait for receiving messages in the DBox. • The TBox is powered: reset the DBox and waits for receiving messages. • The status is Defect: Secure Position. Refer to Alarms and notifications [► 24] and to DBox 5 alarms and non-nominal operation [► 31]. If the alarm persists, contact PVH support.
DBox ignores orders from TBox	DBox is on Local manual mode (buttons or NFC mode).	Touch both buttons at the same time to set the TBox control or place the phone on the NFC tag and send the TBox Control command. The structure will start to move when receives a new message from the TBox.
	DBox is off.	Power the DBox and check the power supply and power switch. If the problem persists, contact PVH support.
	DBox loss of communications.	Read the DBox information with the app and reset if there is a loss of communications. If the alarm persists, contact PVH support.
Buttons are not working	Buttons are disabled.	Press the emergency stop button and then release it. It will activate the buttons for 10 minutes.

PROBLEM	CAUSE	SOLUTION
Red screen appears in App, "Error", it does not connect to the DBOX.	NFC misconnection.	Move the phone closer to the NFC tag again. Try to face the NFC tag with the phone's NFC antenna. If the problem persists, try the connection with another DBOX. If the problem persists, try with another phone. Then, contact PVH support.

FCC STATEMENT

FCC ID: 2BCPR-DBOX5

Contains FCC ID: VPYLB1SJ

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.

NOTE: 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 or more of the following measures:

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

Specific Absorption Rate (SAR) information:

The equipment complies with FCC Radiation exposure limit set forth for an uncontrolled environment. The equipment should be installed and operated with a minimum distance of 20cm between the product and your body.

6. Support

Once the PVH product is installed on field, PVHardware will provide support for the issues which might happen in the plant.

The customer will sign the reception and the agent assigned to the project will contact the customer via email. The customer will be registered on the support portal and will be trained on how to use it.

The Aftersales team can be contacted on: aftersales@pvhardware.es.



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