

# Service codes

---

## Safety



**WARNING!** An electric shock can be fatal. Before opening the device:

- If applicable, turn the mains switch to the O position
- Unplug the device from the mains
- Disconnect the inverter from the DC side
- Using a suitable measuring instrument, ensure that electrically charged parts (e.g. capacitors) are fully discharged
- Restrict access to the working area
- Take steps to ensure the metallic surfaces of the device cannot be touched
- Suitable protective clothing and/or equipment must be worn when carrying out the test or the repair

---

## General

These service codes help to localise and - where possible - rectify faults with the device directly on site. The individual service codes are subdivided into service classes.

The following information is given for every service code:

- the reason the service code is being displayed
- the relevant troubleshooting measure

**IMPORTANT!** Software may only be updated after consulting the Solar Electronics hotline. The need for the update will be clarified in advance depending on the serial number and firmware version.

---

## Displaying status codes

The inverter performs a system self diagnosis that automatically detects many faults that may occur and shows them on the display. This means you are promptly made aware of malfunctions in the inverter and the photovoltaic system, or of any installation or operating faults.

If the system self diagnosis has detected a specific fault, the associated status code will be shown on the display.

**IMPORTANT!** Status codes may sometimes appear briefly as a result of the inverter's control response. If the inverter then continues working with no sign of any problem, this means that there was no fault.

---

## Software update after a PC board replacement

In rare cases, an incompatibility message „State 480“ may occur on the inverter after the PC board has been successfully replaced. Please carry out a software update or contact Fronius Technical Support National.

---

## Total failure of the display

If the display fails to come on some time after sunrise:

- Check the AC voltage ON the inverter connections: the AC voltage must be 230 V (+ 10 % / - 5 %)\*
- Carrying out an AC reset: Disconnect the inverter when not under load from the AC supply and switch it back on

\* The mains voltage tolerance depends on the country setup

**Status codes****Service class 1**

Status codes of these class only arise momentarily and are caused by the public grid.

The initial response of the inverter in this case is to disconnect itself from the grid. The grid is subsequently checked for the stipulated monitoring period. If no further problem has been detected by the end of this period, then the inverter will resume feeding energy into the grid.

<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
102	Grid voltage above permitted limit	<ol style="list-style-type: none"> <li>1. Mains voltage error</li> <li>2. Incorrect values in the Service Menu / Wrong Setup</li> <li>3. Measuring error on the filter board</li> </ol>	<ol style="list-style-type: none"> <li>1. Check mains voltage</li> <li>2. Check values in the Service Menu / Check Setup</li> <li>3. Change filter board</li> </ol>
103	Grid voltage below permitted limit	<ol style="list-style-type: none"> <li>1. Mains voltage error</li> <li>2. Wrong AC cabling</li> <li>3. Incorrect values in the Service Menu / Wrong Setup</li> <li>4. Bad contact: wall bracket &lt;-&gt; filter board</li> <li>5. Measuring error on the filter board</li> </ol>	<ol style="list-style-type: none"> <li>1. Check mains voltage</li> <li>2. Check AC cabling</li> <li>3. Check values in the Service Menu / Check Setup</li> <li>4. Check AC wall bracket screws</li> <li>5. Change filter board</li> </ol>
105	Mains frequency above permitted limit	<ol style="list-style-type: none"> <li>1. Mains voltage error</li> <li>2. Incorrect values in the Service Menu / Wrong Setup</li> <li>3. Reconnection limit</li> <li>4. Ripple control signals</li> <li>5. Measuring error on the filter board</li> </ol>	<ol style="list-style-type: none"> <li>1. Check mains voltage</li> <li>2. Check values in the Service Menu / Check Setup</li> <li>3. Normal legal requirement, no error (50,05Hz)</li> <li>4. Report to TSI specialist</li> <li>5. Change filter board</li> </ol>
106	Mains frequency below permitted limit	<ol style="list-style-type: none"> <li>1. Mains voltage error</li> <li>2. Incorrect values in the Service Menu / Wrong Setup</li> <li>3. Ripple control signals</li> <li>4. Measuring error on the filter board</li> </ol>	<ol style="list-style-type: none"> <li>1. Check mains voltage</li> <li>2. Check values in the Service Menu / Check Setup</li> <li>3. Report to TSI specialist</li> <li>4. Change filter board</li> </ol>
107	Synchronisation with the public mains supply not possible	<ol style="list-style-type: none"> <li>1. Incorrect values in the Service Menu / Wrong Setup</li> <li>2. Bad contact of the power stage set with AC</li> <li>3. Bad AC connection</li> <li>4. Measuring error on the filter board</li> </ol>	<ol style="list-style-type: none"> <li>1. Check values in the Service Menu / Check Setup</li> <li>2. Check AC connector screws</li> <li>3. Check mains connection</li> <li>4. Change filter board</li> </ol>

Code	Description	Behaviour	Remedy
108	Islanding detected	<ol style="list-style-type: none"> <li>1. Islanding detected</li> <li>2. Severe disturbances in public mains</li> <li>3. Bad contact: wall bracket &lt;-&gt; filter board</li> <li>4. Grid Impedance out of permitted values</li> <li>5. Bad AC connection</li> <li>6. Ripple control signals</li> <li>7. Measuring error on the filter board</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatic correction</li> <li>2. Automatic correction</li> <li>3. Check AC wall bracket screws</li> <li>4. Contact utility</li> <li>5. Check AC connection</li> <li>6. Report to TSI specialist</li> <li>7. Change filter board</li> </ol>
112	RCMU Error	<ol style="list-style-type: none"> <li>1. Old filter board software (&lt;4.6)</li> <li>2. Permanent grounding error</li> </ol>	<ol style="list-style-type: none"> <li>1. Software update</li> <li>2. Check AC / DC connections</li> </ol>

### Service class 2

Code	Description	Behaviour	Remedy
240	AFCI tripping	No error, AFCI tripped. Error visible for 4 Seconds then 241	Automatic correction
241 - 242	AFCI tripping	Arc occurred, to resume operation press enter twice (first 242 then operation is resumed)	Check PV generator
245	AFCI selftest fail	<ol style="list-style-type: none"> <li>1. Selftest routine failed due to detection failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter or do a software update</li> <li>2. Change filter board</li> </ol>
247	AFCI currentsensor fail	<ol style="list-style-type: none"> <li>1. Data from primary and secondary current sensor don't correspond</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter or do a software update</li> <li>2. Change filter board</li> </ol>

### Service class 3

Class 3 includes status codes that may occur while feeding energy into the grid, but generally do not cause the process to be interrupted for any length of time

The inverter disconnects automatically from the grid, the grid is then monitored as specified and the inverter attempts to resume feeding energy into the grid.

Code	Description	Behaviour	Remedy
301	Current peak on the mains supply detected	<ol style="list-style-type: none"> <li>1. Voltage drop on the public mains</li> <li>2. Grid Impedance out of permitted values</li> <li>3. Bad contact: wall bracket &lt;-&gt; inverter</li> <li>4. Measuring error on the filter board</li> <li>5. Wrong power limit on device</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatic correction</li> <li>2. Contact utility</li> <li>3. Check AC wall bracket screws</li> <li>4. Change filter board</li> <li>5. Change AC board</li> </ol>

<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
302	Current peak on the PV generator	<ol style="list-style-type: none"> <li>1. Bad contact: wall bracket &lt;-&gt; inverter</li> <li>2. Voltage drop in the public mains</li> <li>3. Measuring error on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Check AC wall bracket screws</li> <li>2. Automatic correction</li> <li>3. Change DC board. Afterwards if necessary AC board</li> </ol>
303	Too high heat sink temperature	<ol style="list-style-type: none"> <li>1. Ventilation opening blocked</li> <li>2. Too high ambient temperature</li> <li>3. In- or outside fan cable not connected</li> <li>4. In- or outside fan defective</li> <li>5. Bad contact: wall bracket &lt;-&gt; heat sink</li> <li>6. Measuring error on the power stage set</li> <li>7. Fan output on Recerbo defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean openings</li> <li>2. Change mounting place</li> <li>3. Connect fan cable</li> <li>4. Change fan</li> <li>5. Check phase change paste</li> <li>6. Change AC board</li> <li>7. Change Recerbo</li> </ol>
306	POWER LOW	<ol style="list-style-type: none"> <li>1. DC power is too low for feeding in</li> <li>2. Measuring error on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Wait for more irradiance or check PV modules</li> <li>2. Change DC board. Afterwards if necessary AC board</li> </ol>
307	DC LOW	<ol style="list-style-type: none"> <li>1. DC main switch open</li> <li>2. PV generator not connected</li> <li>3. DC voltage too low for feeding in</li> <li>4. Reversal voltage of PV generator</li> <li>5. DC operation mode: fix voltage + wrong voltage</li> <li>6. Measuring error on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Close DC main switch</li> <li>2. Connect PV generator</li> <li>3. Wait for more irradiance or check PV modules</li> <li>4. Reverse polarity of PV generator</li> <li>5. Check MPP settings / voltage</li> <li>6. Change DC board. Afterwards if necessary AC board</li> </ol>
308	The intermediate circuit voltage	<ol style="list-style-type: none"> <li>1. Voltage drop on AC grid</li> <li>2. Bad contact: wall bracket &lt;-&gt; inverter</li> <li>3. Measuring error on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatic correction</li> <li>2. Check AC wall bracket screws</li> <li>3. Change AC board</li> </ol>
309	Too high DC1 voltage	<ol style="list-style-type: none"> <li>1. PV generator voltage too high in MPP1</li> <li>2. Wrong DC cabling in MPP 1</li> <li>3. Measuring error on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Check PV configuration</li> <li>2. Check DC cabling</li> <li>3. Change DC board. Afterwards if necessary AC board</li> </ol>
313	Too high DC2 voltage	<ol style="list-style-type: none"> <li>1. PV generator voltage too high in MPP 2</li> <li>2. Wrong DC cabling in MPP 2</li> <li>3. Measuring error on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Check PV configuration</li> <li>2. Check DC cabling</li> <li>3. Change DC board. Afterwards if necessary AC board</li> </ol>

## Service class 4

Some of the class 4 status codes necessitate intervention by a Fronius-trained service engineer.

Code	Description	Behaviour	Remedy
401	Communication error between Recerbo and power stage set	<ol style="list-style-type: none"> <li>1. Ribbon cable between power stage set and filter board faulty or not connected properly</li> <li>2. Ribbon cable defective</li> <li>3. Recerbo not plugged in correctly</li> <li>4. Recerbo defective</li> <li>5. Power stage set defective</li> <li>6. Filter board defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Check ribbon cable between Recerbo and power stage set</li> <li>2. Change ribbon cable</li> <li>3. Check Recerbo plug</li> <li>4. Change Recerbo</li> <li>5. Change AC board</li> <li>6. Change filter board</li> </ol>
406	Temperature sensor in DC semiconductor module defective	<ol style="list-style-type: none"> <li>1. Defective temperature sensor in semiconductor module</li> <li>2. Defective circuit on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Change DC board</li> <li>2. Change DC board</li> </ol>
407	Temperature sensor on the power stage set	<ol style="list-style-type: none"> <li>1. Defective temperature sensor on the power stage set</li> <li>2. Defective circuit on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Change AC board</li> <li>2. Change AC board</li> </ol>
408	On the inverter an unacceptably high DC injection was detected	<ol style="list-style-type: none"> <li>1. Asynchronous AC grid</li> <li>2. Power stage set defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Check AC grid</li> <li>2. Change AC board</li> </ol>
412	Adjusted fix voltage beyond the accessible MPP range	<ol style="list-style-type: none"> <li>1. Fix voltage was adjustable too high or too low</li> </ol>	<ol style="list-style-type: none"> <li>1. Check adjustments in the service menu</li> </ol>
415	Wire shutdown tripped	<ol style="list-style-type: none"> <li>1. Option card tripped a wired shutdown</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatically corrected, option card stopped the inverter</li> </ol>
416 - 425	Communication error between power stage set and Recerbo	<ol style="list-style-type: none"> <li>1. Occurs once - PSP communication error</li> <li>2. Unknown option card blocks the inverter</li> <li>3. Ribbon cable between filter and power stage set defective</li> <li>4. Recerbo defective</li> <li>5. Filter board defective</li> <li>6. Power stage set defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatically corrected</li> <li>2. Software update</li> <li>3. Change ribbon cable</li> <li>4. Change Recerbo</li> <li>5. Change filter board</li> <li>6. Change AC board</li> </ol>
426	Charging intermediate circuit takes too long	<ol style="list-style-type: none"> <li>1. Too less DC Power</li> <li>2. DC inductors not properly connected</li> <li>3. DC booster defect</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter or do a software update</li> <li>2. Check DC inductors screws</li> <li>3. Change DC board. Afterwards if necessary AC board</li> </ol>
427		<ol style="list-style-type: none"> <li>1. Software error</li> <li>2. Measuring error on the power set</li> </ol>	<ol style="list-style-type: none"> <li>1. Update software</li> <li>2. Change AC board</li> </ol>

<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
431	Power stage set is in boot mode	<ol style="list-style-type: none"> <li>1. Power stage set will be programmed by the Recerbo automatically</li> <li>2. Power stage set can not be programmed automatically</li> <li>3. Filter board defective</li> <li>4. Recerbo defective</li> <li>5. Power stage set defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatically corrected</li> <li>2. Software update</li> <li>3. Change Recerbo</li> <li>4. Change filter board</li> <li>5. Change AC board</li> </ol>
432	Consistent error in power stage set management	<ol style="list-style-type: none"> <li>1. Power stage set could not communicate with the Recerbo</li> <li>2. Power stage set defective</li> <li>3. Recerbo defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter or do a software update</li> <li>2. Change AC board</li> <li>3. Change Recerbo</li> </ol>
433	Allocation error of dynamic addresses	<ol style="list-style-type: none"> <li>1. Power stage set could not communicate with the Recerbo</li> <li>2. Power stage set defective</li> <li>3. Recerbo defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter or do a software update</li> <li>2. Change AC board</li> <li>3. Change Recerbo</li> </ol>
436	Problem while error transmitting of the power stage set	<ol style="list-style-type: none"> <li>1. Power stage set could not communicate with the Recerbo</li> <li>2. Power stage set defective</li> <li>3. Recerbo defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter or do a software update</li> <li>2. Change AC board</li> <li>3. Change Recerbo</li> </ol>
437	Problem with the internal error handling	<ol style="list-style-type: none"> <li>1. Power stage set could not communicate with the Recerbo</li> <li>2. Power stage set defective</li> <li>3. Recerbo defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter or do a software update</li> <li>2. Change AC board</li> <li>3. Change Recerbo</li> </ol>
438	Problem while error transmitting from power stage set to Recerbo	<ol style="list-style-type: none"> <li>1. Power stage set could not communicate with the Recerbo</li> <li>2. Power stage set defective</li> <li>3. Recerbo defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter or do a software update</li> <li>2. Change AC board</li> <li>3. Change Recerbo</li> </ol>
445	Country setup information faulty	<ol style="list-style-type: none"> <li>1. Country setup information faulty</li> <li>2. Old software (e.g after print exchange)</li> <li>3. Impossible manual settings in service menu</li> <li>4. Recerbo defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Do a software update and reload country setup from setup menu</li> <li>2. Do a software update and reload country setup from setup menu</li> <li>3. Check settings</li> <li>4. Change Recerbo</li> </ol>
447	Isolation failure detected	<ol style="list-style-type: none"> <li>1. PV generator grounded</li> <li>2. PV generator grounding error</li> <li>3. Measuring circuit on power stack defect</li> </ol>	<ol style="list-style-type: none"> <li>1. Use only ungrounded modules</li> <li>2. Check PV generator</li> <li>3. Change DC board. Afterwards if necessary AC board</li> </ol>
448	Neutral wire fault	<ol style="list-style-type: none"> <li>1. No neutral wire detected</li> <li>2. Wrong setup</li> <li>3. Bad contact: wall bracket &lt;-&gt; inverter</li> <li>4. Filter board defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Check wiring</li> <li>2. Check country setup</li> <li>3. Check AC wall bracket screws</li> <li>4. Change filter board</li> </ol>

<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
451	Flash of the guard defective	<ol style="list-style-type: none"> <li>1. Grid problem</li> <li>2. Defective AC guard on filter board</li> <li>3. Defective AC guard on power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatically corrected</li> <li>2. Change filter board</li> <li>3. Change AC board</li> </ol>
452	Communication between filter & power stage set faulty	<ol style="list-style-type: none"> <li>1. Communication problem caused by temporary environmental disturbances (grid, EMC, ...)</li> <li>2. Ribbon cable between filter board and power stage set defective</li> <li>3. Defective AC guard on filter board</li> <li>4. Defective AC guard on power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatically corrected</li> <li>2. Change ribbon cable</li> <li>3. Change filter board</li> <li>4. Change AC board</li> </ol>
453	Processor guard detected a faulty grid voltage	<ol style="list-style-type: none"> <li>1. Measuring error</li> <li>2. Grid problem</li> <li>3. Defective AC guard on filter board</li> <li>4. Defective AC guard on power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Software update</li> <li>2. Automatically corrected</li> <li>3. Change filter board</li> <li>4. Change AC board</li> </ol>
454	Processor guard detected a faulty grid frequency	<ol style="list-style-type: none"> <li>1. Measuring error</li> <li>2. Grid problem</li> <li>3. Defective AC guard on filter board</li> <li>4. Defective AC guard on power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Software update</li> <li>2. Automatically corrected</li> <li>3. Change filter board</li> <li>4. Change AC board</li> </ol>
456	Error in the Anti Islanding monitoring detected	<ol style="list-style-type: none"> <li>1. Occurs once</li> <li>2. Software problem</li> <li>3. Measuring on filter board</li> <li>4. Measuring circuit for Anti Islanding defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter</li> <li>2. Software update</li> <li>3. Change filter board</li> <li>4. Change AC board</li> </ol>
457	Grid relays do not release	<ol style="list-style-type: none"> <li>1. Occurs once</li> <li>2. Grid test time is too low</li> <li>3. Relay got stuck</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter</li> <li>2. Change settings</li> <li>3. Change AC board</li> </ol>
458	RCMU selftest failed	<ol style="list-style-type: none"> <li>1. RCMU measurement defect</li> </ol>	<ol style="list-style-type: none"> <li>1. Change filter board</li> </ol>
459	Faulty isolation measurement	<ol style="list-style-type: none"> <li>1. Occurs once</li> <li>2. Isolation measuring defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter</li> <li>2. Change DC board. Afterwards if necessary AC board</li> </ol>
460	Reference voltage outside permitted limits	<ol style="list-style-type: none"> <li>1. Occurs once</li> <li>2. Measuring circuit on power stage set defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter</li> <li>2. Change AC board</li> </ol>
461	Defective data memory	<ol style="list-style-type: none"> <li>1. Defective power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Change DC board. Afterwards if necessary AC board</li> </ol>
462	Failure on the DC injection monitoring detected	<ol style="list-style-type: none"> <li>1. Occurs once</li> <li>2. DC injection monitoring defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter</li> <li>2. Change inverter</li> </ol>

<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
463	AC pole reserved	1. AC connector between power stage and filter board mounted in wrong direction (L1 and L2 exchanged)	1. Check wiring
472	defective grounding fuse	1. Defective grounding fuse 2. Wrong settings in service menu basic	1. Change grounding fuse 2. Set DC mode to ,floating'
474	RCMU sensor error	1. Quick radiation changes 2. Sensor defect	1. Automatically corrected 2. Change filter board
475	Isolation failure detected	1. Wrong setting 2. PV generator grounding error 3. Measuring circuit in power stage set defective	1. Check ISO / GFDI setting 2. Check PV generator 3. Change DC board. Afterwards if necessary AC board
476	Internal power supply missing	1. Grid voltage too low 2. Grid test time is too low 3. Defective internal power supply 4. Defective internal power supply	1. Check wiring 2. Grid failure 3. Change AC board 4. Change filter board
480	Power stage set software incompatible to display software	1. Old power stage set software 2. Old software 3. Incompatible hardware combinations	1. Software update 2. Reload setup 3. Check hardware components
481	Recerbo has old software version	1. Old Recerbo software 2. Old software 3. Incompatible hardware combinations	1. Software update 2. Reload setup 3. Check hardware components
482	Inverter switched off during commissioning	1. Startup procedure not successful	1. Restart inverter
483	Adjusted fix voltage DC2 beyond the accessible MPP range	1. Fix voltage was adjusted too high or too low	1. Check settings
484 - 485	Data transfer error	1. Communication problem caused by temporary environmental disturbances (grid / EMC, ...) 2. Ribbon cable between filter board and power stage set 3. Defective AC guard on filter board 4. Defective AC guard on power stage set	1. Automatically corrected 2. Change ribbon cable 3. Change filter board 4. Change AC board

### **Service class 5 - 6**

Class 5 status codes do not generally prevent the feeding of energy into the grid, but can restrict it. A status code is displayed until it is acknowledged by pressing a key (the inverter, however, continues to operate normally in the background).



Code	Description	Behaviour	Remedy
502	An isolation fault between DC+ / DC- to earth has been detected	1. Isolation fault at the PV generator	1. Check cables and PV generator
509	No feed-in operation for 24 hours	1. Snow covered or very dirty modules 2. Insufficient power from the modules for feed in operation	1. Clean modules or remove snow 2. Check other service codes
515	EEPROM communication failure	1. Occurs once 2. Filter calibration value not correct	1. Restart inverter 2. Change AC board. Afterwards if necessary DC board
516	Communication error inside the power stage set	1. Occurs once 2. Power stage set defective	1. Restart inverter 2. Change board
517	Power stage set derating caused by too high temperature	1. Ventilation opening blocked 2. Too high ambient temperature 3. Fan cables not connected 4. Fan defective 5. Bad contact: power modul <-> heat sink 6. Filter board defective 7. Recerbo defective 8. Measuring error on the power stage set	1. Clean openings 2. Change mounting place 3. Connect fan cables 4. Change fan 5. Check phase change paste 6. Change filter board 7. Change Recerbo 8. Change board
519	Communication error inside the power stage set	1. Occurs once 2. Filter board defective	1. Restart inverter 2. Change filter board
520	No feed-in fpr 24 hours from DC1 Input	1. Snow covered or very dirty modules 2. Insufficient power from the modules for feed in operation 3. Input not used	1. Clean modules or remove snow 2. Check other service codes 3. Configure inverter as monostring
521	No feed-in fpr 24 hours from DC2 Input	1. Snow covered or very dirty modules 2. Insufficient power from the modules for feed in operation 3. Input not used	1. Clean modules or remove snow 2. Check other service codes 3. Configure inverter as monostring
522	DC LOW Ch1	1. DC main switch open 2. PV generator not connected 3. DC voltage too low for feeding in 4. Reversal voltage of PV generator 5. DC operating mode: fix voltage and wrong voltage 6. Measuring error on the power stage set	1. Close DC main switch 2. Connect PV generator 3. Wait for more irradiance or check modules 4. Change polarity of PV generator 5. Check MPP settings / voltage 6. Change DC board. Afterwards if necessary AC board

<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
523	DC LOW Ch2	<ol style="list-style-type: none"> <li>1. DC main switch open</li> <li>2. PV generator not connected</li> <li>3. DC voltage too low for feeding in</li> <li>4. Reversal voltage of PV generator</li> <li>5. DC operating mode: fix voltage and wrong voltage</li> <li>6. Measuring error on the power stage set</li> </ol>	<ol style="list-style-type: none"> <li>1. Close DC main switch</li> <li>2. Connect PV generator</li> <li>3. Wait for more irradiance or check modules</li> <li>4. Change polarity of PV generator</li> <li>5. Check MPP settings / voltage</li> <li>6. Change DC board. Afterwards if necessary AC board</li> </ol>
558	Country setup not supported by power stage set	<ol style="list-style-type: none"> <li>1. Old software</li> <li>2. Old software</li> <li>3. Incompatible hardware combinations</li> </ol>	<ol style="list-style-type: none"> <li>1. Software update</li> <li>2. Reload setup</li> <li>3. Check hardware components</li> </ol>
559	Feature nor supported by Recerbo	<ol style="list-style-type: none"> <li>1. Old software</li> <li>2. Old software</li> <li>3. Incompatible hardware combinations</li> </ol>	<ol style="list-style-type: none"> <li>1. Software update</li> <li>2. Reload setup</li> <li>3. Check hardware components</li> </ol>
560	Power reduction because of over frequency	<ol style="list-style-type: none"> <li>1. Too high grid frequency</li> <li>2. Grid disturbances</li> <li>3. Wrong settings</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatically corrected</li> <li>2. Software update</li> <li>3. Check settings</li> </ol>
565	AFCI SD card failure	<ol style="list-style-type: none"> <li>1. Writing data to SD card failed</li> </ol>	<ol style="list-style-type: none"> <li>1. Format SD card</li> </ol>
566	AFCI deactivated	<ol style="list-style-type: none"> <li>1. No error, AFCI is deactivated</li> </ol>	<ol style="list-style-type: none"> <li>1. If AFCI has to be switched on, use tool</li> </ol>
567	GVDPR active	<ol style="list-style-type: none"> <li>1. Too high grid voltage</li> <li>2. Grid disturbances</li> <li>3. Wrong settings</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatically corrected</li> <li>2. Software update</li> <li>3. Check settings</li> </ol>
601	Internal communication fault	<ol style="list-style-type: none"> <li>1. Occurs once</li> <li>2. Occurs permanently</li> </ol>	<ol style="list-style-type: none"> <li>1. Restart inverter</li> <li>2. Change AC board</li> </ol>
602	Auto test Italy failed	<ol style="list-style-type: none"> <li>1. Auto test Italy was started and not finished or failed</li> </ol>	<ol style="list-style-type: none"> <li>1. Reload setup</li> </ol>
603	Temperature sensor in $\mu$ C defect (Ch3 AC Temp)	<ol style="list-style-type: none"> <li>1. Defective temperature sensor <math>\mu</math>C</li> <li>2. Defective circuit on the power stage</li> </ol>	<ol style="list-style-type: none"> <li>1. Change power stack</li> <li>2. Change AC board</li> </ol>
604	Temperature sensor in DC module 2 defect (Ch4 DC2)	<ol style="list-style-type: none"> <li>1. Defective temperature sensor in DC module 2</li> <li>2. Defective circuit on the power stage</li> </ol>	<ol style="list-style-type: none"> <li>1. Change DC board</li> <li>2. Change DC board</li> </ol>
607	RCMU continous fault occured more than 4 times in 24 hours	<ol style="list-style-type: none"> <li>1. Grounding problem</li> </ol>	<ol style="list-style-type: none"> <li>1. Automatically corrected after 24 hours</li> <li>2. Check PV array</li> <li>3. Check wiring</li> </ol>

## Service class 7 - 10

Class 7 status codes related to control system, the configuration and inverter data recording, and may directly or indirectly affect the process of feeding energy into the grid.

Code	Description	Behaviour	Remedy
701*	LN node type out of range	1. Wrong LN number 2. EEPROM defective	1. Insert LN number again 2. Change Recerbo
702*	Recerbo buffer full	1. Problems with LN ring 2. Recerbo defective	1. Check LN ring 2. Change Recerbo
703*	LN send buffer full	1. Problems with LN ring 2. Recerbo defective	1. Check LN ring 2. Change Recerbo
705*	LN number exists 2 times	1. LN number exists 2 times	1. Change LN number, LN number must be unique
706* - 707*	Key controller communication failed	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
711*	EEPROM error	1. Recerbo defective	1. Change Recerbo
712*	Failure while writing on EEPROM	1. Occurs once	1. Automatically corrected
713	EEPROM data could not be read completely	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
714* - 715*	Failure while reading from EEPROM	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
721	Failure while writing on EEPROM	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
722* - 726*	Failure while reading / writing from EEPROM	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
727* - 730*	EEPROM backup defective	1. Occurs once 3. Recerbo defective	1. Automatically corrected 3. Change Recerbo
731	Failure while initialising, USB flash drive was not detected	1. USB flash drive read / write protected 2. USB flash drive not detected 3. USB flash drive not supported 4. Access time of the inverter too fast	1. Remove read / write protection 2. Format USB flash drive 3. Use another USB flash drive 4. Update software
732	Failure while initialising, USB flash drive has a too high current	1. USB flash drive ineligible due to too high current	1. Use another USB flash drive
733	No USB flash drive inserted, although there should be	1. No USB flash drive inserted 2. Unplugged USB flash drive while updating	1. Insert USB flash drive 2. Reconnect USB flash drive and start update again
734	Update file not identified	1. Update file has wrong format 2. Update in the wrong file	1. Name update file correctly (e.c. Froxxxxx.upd) 2. Store update on root directory



<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
735	For this inverter no fitting update is on the USB flash drive	<ol style="list-style-type: none"> <li>1. Old or defective update on the USB flash drive</li> <li>2. Update file from another inverter</li> <li>3. Compatibility error</li> </ol>	<ol style="list-style-type: none"> <li>1. Load new update on the USB flash drive</li> <li>2. Use the correct update file</li> <li>3. Check hardware components</li> </ol>
736	Read or write error appeared	<ol style="list-style-type: none"> <li>1. Incorrectly formatted USB flash drive</li> <li>2. USB flash drive secured with a password</li> <li>3. Read or write protection on the USB flash drive</li> </ol>	<ol style="list-style-type: none"> <li>1. Format USB flash drive with FAT32</li> <li>2. Delete password protection</li> <li>3. Delete read or write protection</li> </ol>
737	Update file couldn't be opened	<ol style="list-style-type: none"> <li>1. Defective update file</li> <li>2. Failure while formatting</li> </ol>	<ol style="list-style-type: none"> <li>1. Load new update on the USB flash drive</li> <li>2. Format USB flash drive</li> </ol>
738	Creating a Logfile is not possible	<ol style="list-style-type: none"> <li>1. Incorrectly formatted USB flash drive</li> <li>2. USB flash drive secured with a password</li> <li>3. Read or write protection on the USB flash drive</li> </ol>	<ol style="list-style-type: none"> <li>1. Format USB flash drive with FAT32</li> <li>2. Delete password protection</li> <li>3. Delete read or write protection</li> </ol>
740	Failure while writing initialising	<ol style="list-style-type: none"> <li>1. Failure in the USB flash drive format</li> <li>2. Defective USB flash drive</li> </ol>	<ol style="list-style-type: none"> <li>1. Format USB flash drive</li> <li>2. Use another USB flash drive</li> </ol>
741	Failure while writing on USB flash drive	<ol style="list-style-type: none"> <li>1. Memory on USB flash drive full</li> <li>2. Memory on USB flash drive too small</li> <li>3. USB flash drive unplugged while writing</li> <li>4. Mains voltage drop out while writing</li> <li>5. Invalid data</li> </ol>	<ol style="list-style-type: none"> <li>1. Delete data from USB flash drive</li> <li>2. Use a bigger USB flash drive</li> <li>3. Reconnect USB flash drive and start update again</li> <li>4. Check grid</li> <li>5. Format USB flash drive</li> </ol>
743	Update failed	<ol style="list-style-type: none"> <li>1. Unplugged USB flash drive while updating</li> <li>2. Update failed</li> <li>3. Read or write protection on the USB flash drive</li> <li>4. Compatibility error</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect USB flash drive and start update again</li> <li>2. Restart update</li> <li>3. Delete read or write protection</li> <li>4. Check hardware components</li> </ol>
745	Checksum test failed	<ol style="list-style-type: none"> <li>1. File on USB flash drive is defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Format USB flash drive</li> </ol>
746	One or more boards could not be identified	<ol style="list-style-type: none"> <li>1. Boards have not started completely yet</li> <li>2. Boards have not started completely yet</li> <li>3. Print data of some boards are incompatible</li> </ol>	<ol style="list-style-type: none"> <li>1. Wait 1 minute with the update</li> <li>2. See device -&gt; info menu: all versions available?</li> <li>3. Change inverter</li> </ol>

<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
751	Lost real time clock	1. Inverter had no AC connection for longer than 5 days 2. Memory of the Recerbo defective	1. Set time 2. Change Recerbo
754* - 755*	Time set	1. Time / data has been set	
757	Time can not be stored, due to safety reasons the inverter does not feed in	1. Defective real time clock	1. Change Recerbo
758	RTC quartz in emergency operation	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
760	Systemquarz defective	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
761*	Reading error of on-board storage print	1. On-board storage print is missing 2. Defective ribbon cable 3. Recerbo defective 4. On-board storage print is defective	1. Change interface board with the one containing the on-board storage print 2. Change ribbon cable 3. Change Recerbo 4. Change inverter
762*	Reading error of attached storage print	1. Attached storage print is missing 2. Defective ribbon cable 3. Recerbo defective 4. Attached storage print is defective	1. Usage / attach the original storage print 2. Change ribbon cable 3. Change Recerbo 4. Change inverter
763*	Power limitation of the on-board storage print not readable	1. On-board storage print is missing 2. Recerbo defective 3. On-board storage print is defective	1. Usage / attach the original storage print 2. Change Recerbo 3. Change inverter
765*	Recerbo can not read power limitation	1. Recerbo defective	1. Change Recerbo
766	No power limitation found	1. Recerbo defective 2. On-board or attached storage print is defective	1. Change Recerbo 2. Change inverter
767*	Power limitation not readable	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
768	Power limitation while feeding-in operation changed	1. Attached storage print is being connected or disconnected during feeding in operation	1. Automatically corrected
772	Memory on the storage print not available, due to safety reasons the inverter does not feed in	1. SSP not connected	1. Check SSP
773	Memory on the storage print not initialised, due to safety reasons the inverter does not feed in	1. Memory not programmed or memory lost 2. Defective Recerbo	1. Reload setup 2. Change Recerbo

<b>Code</b>	<b>Description</b>	<b>Behaviour</b>	<b>Remedy</b>
775	Faulty programming of the power stage set	1. Power stage set or filter board not programmed	1. See device -> info menu: look for missing versions infos and change defective print
782* - 783*	Error during update	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
784*	Waiting on flash / busy	1. Occurs once 2. Recerbo defective	1. Automatically corrected 2. Change Recerbo
789*	Setup CRC failed	1. Wrong / defective data in flash 2. Recerbo defective	1. Update software 2. Change Recerbo
794*	Flash data structure defect	1. Wrong / defective data in flash 2. Recerbo defective	1. Update software 2. Change Recerbo
901	Deviation of measurement channel 1	Current of channel 1 deviates from the other channels	Check settings, DC fuse and modules
902	Deviation of measurement channel 2	Current of channel 2 deviates from the other channels	Check settings, DC fuse and modules
903	Deviation of measurement channel 3	Current of channel 3 deviates from the other channels	Check settings, DC fuse and modules
904	Deviation of measurement channel 4	Current of channel 4 deviates from the other channels	Check settings, DC fuse and modules
905	Deviation of measurement channel 5	Current of channel 5 deviates from the other channels	Check settings, DC fuse and modules
990	Deviation of output from radiation sensor value too big	Difference between the performance of the irradiation sensor and that of the inverter too big	Check archives values, shadow of the modules, blown string fuse or defect
991	Deviation of radiation sensor too big	The radiation sensor deviates too far	Check if your radiation sensor is soiled, shaded or defect
992	No radiation sensor values or value(s) not permitted	The radiation sensor does not return any values or returns values that are not permitted	Check the cable lines of the radiation sensor
993	Faulty energy report	Faulty energy report due to missing archive values	Check archive values at Fronius Solar.web server or Datalogger
996	No connection to Fronius Solar.web	No connection to Fronius Solar.web	1. Check LED status on Datalogger 2. Restart Datalogger 3. Check internet connection 4. Check if customer has got timer to switch off internet connection and time interval settings is too short
997	Deviation between inverters	Deviation of the kWh value between inverters depending on the settings in Fronius Solar.web	Check settings in system administration in Fronius Solar.web (real Wpeak per inverter and deviation), inquire if there are shadows etc.

Code	Description	Behaviour	Remedy
998	Fronius Solar.net loop is open more than 24h	Fronius Solar.net is not closed and the X-LED is red on the Datamanager or Datalogger	<ol style="list-style-type: none"> <li>1. Check Fronius Solar.net loop</li> <li>2. Check network cabling</li> <li>3. Check Fronius Com Card</li> </ol>
999	24h no feed in	<ol style="list-style-type: none"> <li>1. No communication between inverter and Datamanager or Datalogger more than 24h</li> <li>2. No communication between Fronius Sensor Card and Datamanager or Datalogger more than 2h</li> </ol>	<ol style="list-style-type: none"> <li>1. Check LED status from Datamanager or Datalogger</li> <li>2. Check archive values and Fronius Solar.net loop</li> </ol>
1000* - 1001*	Service-Message	Are harmless for a faultless feeding in process and gives information about the internal processor status	
1201* - 1210*	Service-Message	Are harmless for a faultless feeding in process and gives information about the internal processor status	

\* ... Code appears only with Eventlogging and in the Error Counter

**Customer service**     **IMPORTANT!** Contact your Fronius dealer or a Fronius-trained service technician if

- an error appears frequently or all the time
- an error appears that is not listed in the tables

**Operation in dusty environments**     When operating the inverter in extremely dusty environments: when necessary, clean the cooling elements and fan on the back of the inverter as well as the air intakes at the wall bracket using clean compressed air.

# Error flowchart

---

## General

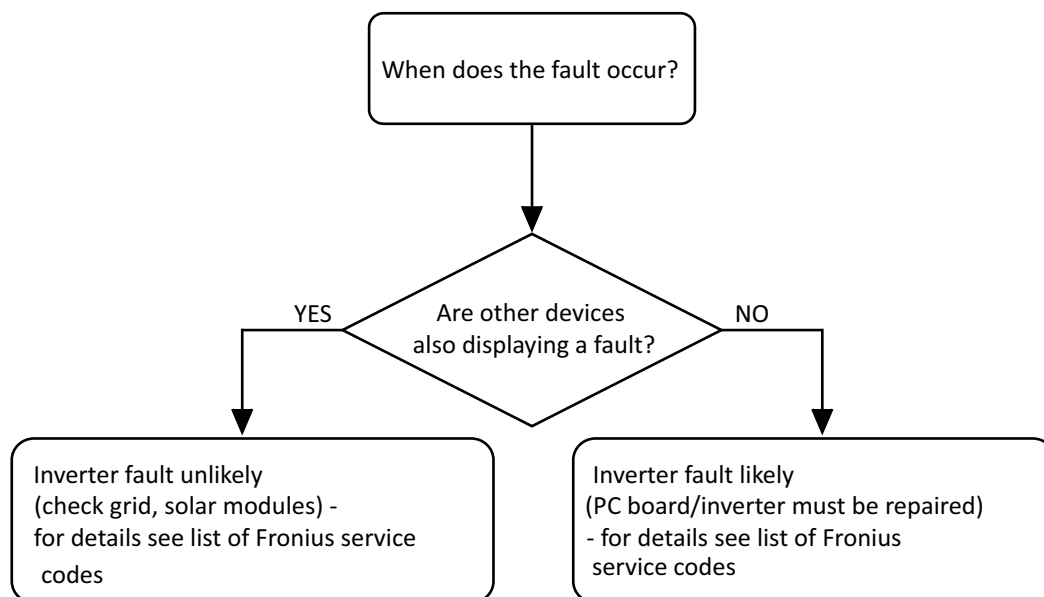
The error search tree is used to systematically locate and rectify errors.

Before starting any troubleshooting activities, read the "Function overview" section in order to understand the layout of the device and how it works.

Essential system data:

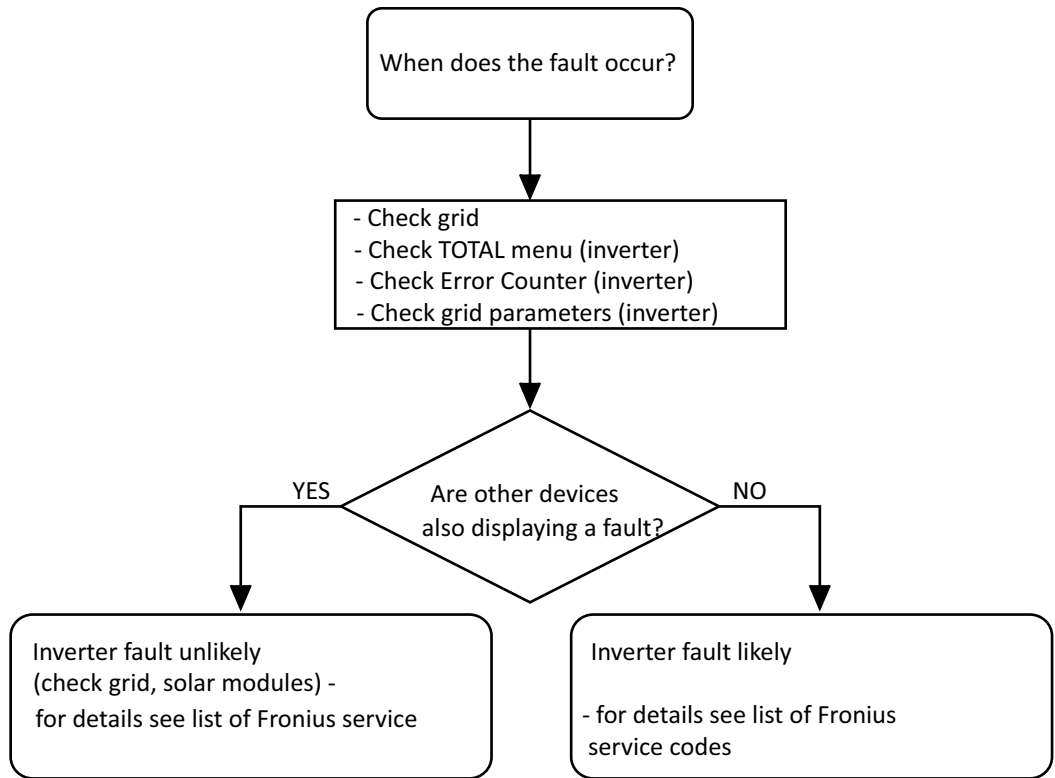
- Inverter type
  - Serial number of the installed inverter
  - Service code shown on the display (State PS menu)
  - Name of PV system (name of system operator)
  - System operating period
  - Location of system
  - Number of inverters installed in system (type, serial number)
  - DC and AC voltage
- 

## Permanent faults





### Temporary faults



### Abnormal behaviour

