

ACE Series

User Manual

Teleste Corporation



ACE2
Intelligent broadband amplifier

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Introduction

ACE2 is an intelligent broadband amplifier with one active output and forward gain up to 44 dB. It offers high output level and supports 1.2 GHz / 204 MHz bandwidth.

ACE2 has integrated electrical controls in both up- and downstream. An intelligent automatic alignment system with wide level control range ensures optimum operation of the ACE2 amplifier. It replaces conventional mechanical plug-in module adjustments and laborious control of parameters. All the adjustments are electrical and controlled with a management interface. Plug-in attenuators or equalisers are not needed.

The ACE2 has no transponder slot but instead has built-in RIS (Remote Ingress Switching) receiver. RIS system offers a cost effective way to tackle ingress as it can be used to control ingress switches, meaning transponders are not needed. It also supports support remotely managed diplexer filters.

Local configuration of ACE2 is done via its external USB interface using a Windows PC or tablet equipped with CATVisor Commander software or Android mobile device equipped with Teleste Commander software. Wireless Bluetooth connection can be established with AC6901 USB to Bluetooth adapter.

Installation

Housing

The ACE2 can be installed either into a street cabinet or to the outdoor environment. The amplifier should be installed vertically so that the external cable connectors and ventilation hole are underneath, securing the housing with three mounting brackets. When positioning the amplifier in its final location, make certain that it has adequate ventilation on all sides. In particular, it is necessary to provide at least 150 mm of room above the amplifier for air circulation. The position of the mounting brackets as well as the installation dimensions are depicted in Figure 1.

The lid opens with the hinges to the left. The open cover can be removed by first opening the lid into a 90 degrees angle and the lifting it off the hinges.

Before closing the lid ensure that:

- nothing is trapped between the lid and the case
- all case gaskets are in their correct positions
- lid seats evenly on the rubber gasket

Using 4 mm allen key, the lid retaining bolts are fasten in a diagonal sequence with a tightening torque of 3 Nm. The class of enclosure is IP54 when correctly installed and tightened.

Amplifier housing should be grounded with at least 4 mm² grounding wire (Cu) from a proper earth to the grounding point.

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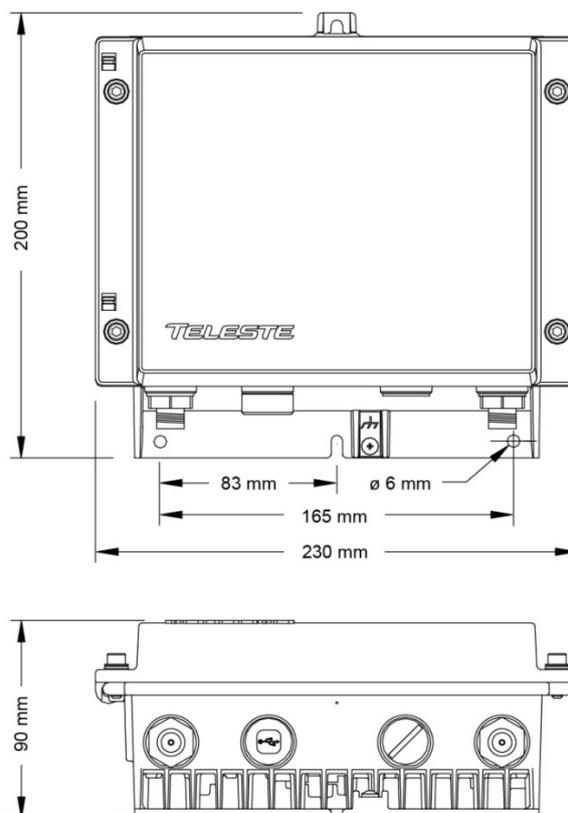


Figure 1. ACE2 housing dimensions – top and side view

Interfaces

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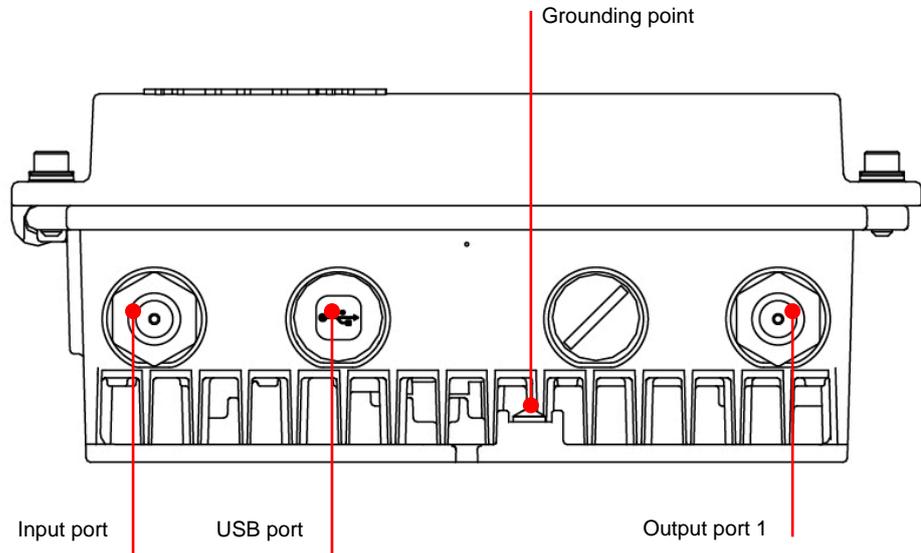


Figure 2. Port locations

The ACE2 amplifier has two RF ports underneath the housing: input and output. In addition there is a port for the USB management interface.

All RF ports have a standard PG11 thread and they accept any KDC type adapter or connector. Suitable length for the centre conductor pin is approximately 20 mm (Figure 3). Screw the KDC connector/adapter body into the port. Tighten the centre conductor seizure screw and torque to 0.7 Nm. Do not over tighten.

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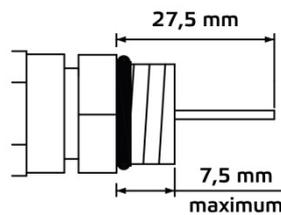


Figure 3. Centre conductor length

Powering



NOTE! To reduce the risk of electric shock, do not remove the shielding cover of the power supply unit if it is connected. All electrical installations must be carried out by authorized and competent technicians in accordance with the national or regional electrical regulations.

Common precautions:

- The ACE2 amplifier is intended for installation in restricted access locations (dedicated equipment rooms, equipment closet, or the like)
- Operate the device only on the specified supply voltage.
- The ACE2 must never be operated without its power supply unit shielding cover.
- The ACE2 has no separate power switch thus the power plug must be easily accessible.
- Disconnect the power cord by the connector only. Never pull on the cable portion of the power cord.
- Do not place or drop heavy or sharp-edged objects on the power cord.
- The power must be disconnected when installing or removing the ACE2.

The ACE2 can be powered by several PSU options. Every option has its own advantages and limitations which are described briefly as follows.

230 V AC:

The locally powered ACE2 amplifier is connected to the mains voltage of 205...255 V AC via its own power cord. The supply voltage fuse (T3.15 A / 250 V) is located on the upper left corner of the amplifier (Figure 8 pos. 1). The power supply is double shielded and does not require separate grounding. However, ensure that the housing of the ACE2 is properly connected to the earth in order to meet safety requirements. Proper grounding will also improve protection from the effects of interference and thus increase the overall reliability of the system.

27...65 V AC:

The supply voltage of the remote powered ACE2 (27...65 V AC) is supplied via a coaxial cable by inserting a fuse to the corresponding fuse holder or directly at the external input. The external input is located on the power distribution board at the upper right corner of the node. External power can also be fed through the node into the network. Maximum feed-through current is 7 A per port (12 A total). If powering will be provided through a dedicated output port, the port must be equipped with a fuse (supplied).

Front panel

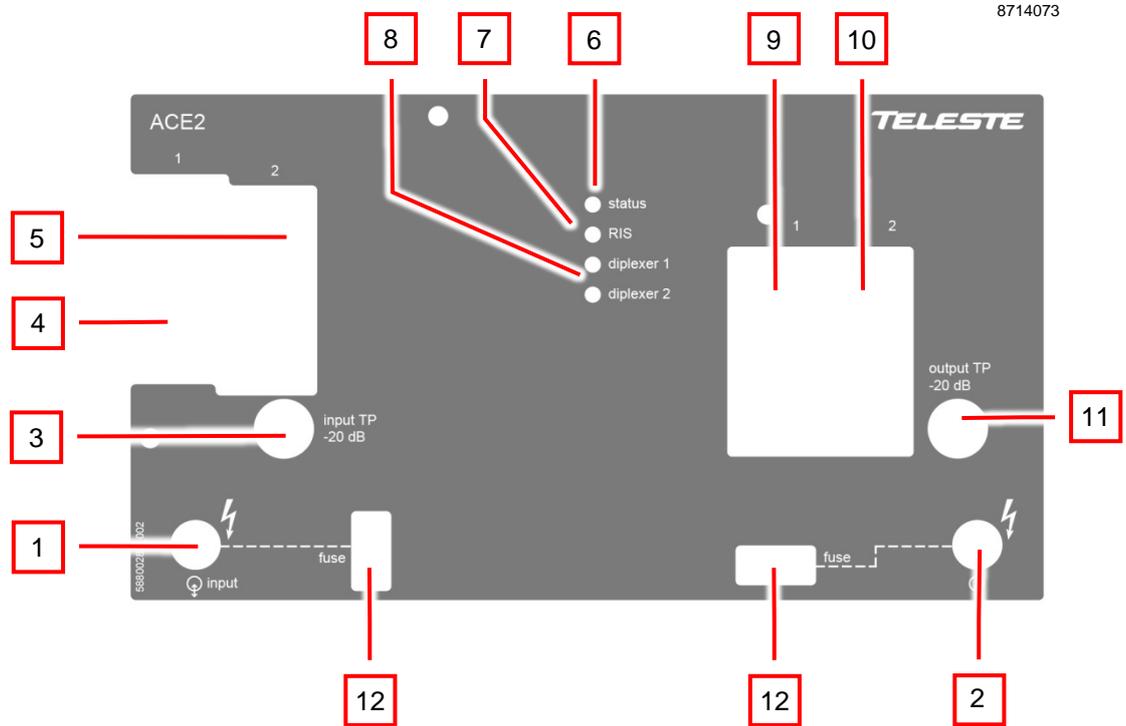


Figure 4. ACE2 front panel

- | | |
|---------------------------------|--|
| 1) Input port | 7) RIS indicator |
| 2) Output port | 8) Diplexer indicators |
| 3) Input test point -20 dB | 9) Output diplex filter module 1 |
| 4) Input diplex filter module 1 | 10) Output diplex filter module 2 |
| 5) Input diplex filter module 2 | 11) Output test/injection point -20 dB |
| 6) Status indicator | 12) Fuse(s) |

Features

Diplex filter modules

The ACE2 amplifier is delivered according to the specifications defined in the ordering code. The available diplex filter types are CXF065 (65/85 MHz), CXF085 (85/105 MHz) and CXF204 (204/258 MHz) and their high-pass versions (with "18/19" extension).

ACE2 support two sets of electrically controlled diplex filters. This makes it possible to change the frequency split in use via local user interface or remotely via the RIS connection.

Diplex filters are automatically recognised by the software. Input diplex filter 1 and output diplex filter 1 must be both either CXF065 or CXF085. Input diplex filter 2 and output diplex filter 2 must be both CXF204. If unknown or incompatible diplex filters are detected the "Unknown module" alarm is set.

Forward path

The input and output amplifier stages are both based on high performance solutions which allow both high and low output levels. The output stage uses a GaN hybrid to improve RF performance over the entire 85 to 1218 MHz pass band. ACE2 must have a proper matching at output port to ensure optimal and reliable operation.

Built-in cable simulator

ACE2 has a built-in cable simulator integrated into its input slope control. The cable simulator is enabled when the input slope is set to negative value. This reduces the available total gain by 13 dB.

Forward path slope control

ACE2 has two 1.2 GHz slope control elements in its forward path signal route:

- 1) **Input slope:** coupled with built-in cable simulator. Adjustable in 1 dB steps between -13 and 20 dB. Negative values enable the built-in cable simulator and reduce the gain by 13 dB. Input slope should be adjusted to get desired output levels after first setting correct interstage slope value.
- 2) **Interstage slope:** Adjustable in 0.1 dB steps between 8 and 18 dB. Should be selected according to desired output slope.

Forward path gain control

ACE2 adjusts its input and interstage gain control elements to achieve optimum performance based on the total gain value selected by the user.

The total gain value and adjustment range decreases by 13 dB when input slope cable simulator is enabled: gain range is 14...44 dB with cable simulator disabled and 1...31 dB with cable simulator enabled. Adjustment step is 0.5 dB.

Power save

The RF performance and power consumption of ACE2 can be adjusted by controlling the output hybrid's current. Power save is disabled as factory default. This ensures full performance and should be used if output levels are close to maximum. If output levels are more than 3 dB below maximum levels, power save can be enabled to save ~2 W without effect on RF performance.

Return path

ACE2 supports 65 MHz, 85 MHz and 204 MHz return path and two separate diplex filter sets which can be activated also remotely.

Diplex filter set 1 can be equipped either with 2*CXF065 or 2*CXF085 diplex filters. The slope adjustment corner frequency is always 85 MHz.

Diplex filter set 2 must be equipped with 2*CXF204 diplex filters. The slope adjustment corner frequency is 204 MHz.

Return path gain and slope control

ACE2 adjusts its two gain control elements and one slope control element to achieve optimum return path performance based on the gain and slope values selected by the user. The gain and slope adjustment ranges depend on the selected bandwidth, i.e. selected diplex module set.

Gain adjustment: 0...28 dB (65/85 MHz) or 1...29 dB (204 MHz), 0.5 dB steps.

Slope adjustment: 0...15 dB (65/85 MHz) or 0...18 dB (204 MHz), 0.5 dB steps.

Note that the slope adjustment corner frequency is either 85 MHz or 204 MHz according to selected diplex filter set. Thus with 65 MHz operation (CXF065) the return path slope adjustment affects also gain at 65 MHz and maximum gain cannot be reached if slope values above 0 dB are used.

Ingress control switch

Ingress control switch can be used to attenuate return path or to cut it off completely. Ingress switch can be controlled locally or remotely via RIS link. The default attenuation value 6 dB can be adjusted between 3 and 10 dB.

Return path automatic alignment

Return path automatic alignment can be activated via the user interface. It relies on forward path to be correctly aligned.

It is assumed that previous amplifier's level and slope settings are identical to this one, i.e. all needed gain and slope adjustment is due to either cable losses or passive splitting of signal between amplifiers. The amount of cable and passive attenuation is calculated from forward path gain and slope values. Return path gain and slope values are then calculated from these values.

The "Return path gain boost" and "Return path slope boost" values are added to the calculated return path gain and slope values and can be used to fine-tune automatic alignment. This can be useful e.g. in cases where previous amplifier forward path output level is different than this amplifier output level, causing return path automatic alignment error. For example, if this amplifier output level is 5 dB higher than previous amplifier output level, the return path gain boost should be set to -5 dB to get correct return path automatic alignment result.

Return path ingress switch value is not taken into account by and not adjusted by return path automatic alignment.

A "best effort" alignment is made if target cannot be reached.

Return path adjustment during diplex filter change

When active diplex filter set is changed, i.e. from 65/85 MHz to 204 MHz or vice versa, the return path gain and slope adjustment values are automatically recalculated to get same frequency response in the common 5...65/85 MHz range. Thus if the return path was correctly aligned for 65/85 MHz operation during ACE2 installation it should be correctly aligned also when 204 MHz operation is activated.

Remote communication

ACE2 has a built-in RIS (Remote Ingress Switching) receiver.

There are no communication settings available for the user. RIS receiver automatically scans for RIS carrier (generated by HDM155 RIS controller) within its tuning range. When a RIS carrier is found, RIS receiver locks to the channel and reacts to commands sent to its MAC address. If the RIS receiver doesn't receive any packets during 1 minute it starts scanning again.

ACE2 front panel has a "RIS" led which indicates communication status:

- **Dark:** Searching for RIS carrier.
- **Blinking green:** Locked to RIS carrier, but no commands received in last 2 minutes. This usually means that ACE2's MAC address has not been entered in RIS controller's device list.
- **Green:** Locked to RIS carrier and receiving commands.
- **Yellow:** Locked to RIS carrier and received "Ingress attenuate" command.
- **Red:** Locked to RIS carrier and received "Ingress off" command.

Establishing connection

All the needed configurations and adjustments can be carried out locally or remotely by using the CATVisor Commander software. Detailed CATVisor Commander hardware requirements and installation instructions can be found from the User Manual supplied with Commander.

Connection to ACE2 is possible using the following methods:

Local configuration with a PC

Commander 2.9 or later is needed for USB and Bluetooth support.

Connection to ACE2 USB port can be done with a standard USB A plug to USB mini B plug cable, or via AC6901 USB to Bluetooth adapter. The cable or adapter should be disconnected when not in use to avoid possible EMC problems caused by the cable acting as an antenna.

ACE2 will draw power from the USB connector for its microcontroller and memory if no external power supply is available. This makes it possible to configure ACE2 settings and update the software without any power supply.

Note that because only the CPU part of the unit is powered via USB many parameters visible via the user interface may display incorrect values.

Local configuration with an Android device

Teleste Commander software for Android devices can be downloaded from Google Play. Connection to ACE2 USB port can be done via AC6901 USB to Bluetooth adapter. The adapter should be disconnected when not in use to avoid possible EMC problems caused by the adapter acting as an antenna.

Alarms

The module alarms, also known as "flags", displayed in CATVisor Commander are described in the table below.

The affected led and factory default severity settings are presented next to each alarm in Table 1. All alarm severities (Major / Minor / Notification / Disabled) and alarm limits can be fully configured by the user. See the 'Monitoring' chapter for more details.

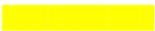
Note that some alarm limits (for example remote AC supply voltage) are factory configured so that alarms will only appear when hardware specifications are exceeded. The alarm limits should be reconfigured to match network parameters if more precise monitoring is needed.

Analog alarm	Description & suggested corrective action	Led	Default severity
Temperature high	Temperature is above high limit.	Status	Major & Minor
Temperature low	Temperature is below low limit.	Status	Minor
AC voltage high	AC voltage is above high limit.	Status	Minor
AC voltage low	AC voltage is below low limit. As some units are equipped with mains power supply, this alarm is disabled as factory default and should be enabled by the user if AC voltage is to be monitored.	Status	Disabled
+24V voltage high	+24V voltage is above high limit.	Status	Major & Minor
+24V voltage low	+24V voltage is below low limit.	Status	Major & Minor
+12V voltage high	+12V voltage is above high limit.	Status	Major & Minor
+12V voltage low	+12V voltage is below low limit.	Status	Major & Minor
Discrete alarm	Description & suggested corrective action	Led	Default severity
Unknown module	Device is not able to recognise duplex filter module(s), or module types do not match. Possible reason is wrong module type, malfunction or bad installation of a plug-in module. If unit software is up to date and removing and reinstalling plug-in modules doesn't help, contact Teleste support.	Status	Major
Internal error	Device has an internal error. If resetting the unit does not help, contact Teleste support.	Status	Major
Return path off	Return path is turned off by user.	Status	Notification
Return path attenuated	Return path is attenuated.	Status	Notification
Settings changed	Unit's settings have been modified by user during last minute.	Status	Notification
Application started	Unit was reset or rebooted during last minute.	Status	Notification
Application updating	Unit or plug-in module software is being updated. No changes should be made to powering, plug-in modules or settings during software update.	Status	Minor
Service terminal connected	There has been activity on local USB connector during last minute.	Status	Notification
Modem not connected	RIS receiver is not locked to carrier.	Modem	Notification
Powered from USB	Processor powered from USB, rest of motherboard not alive.	Status	Notification

Table 1. ACE2 alarms

Led usage

The 4 led indicators on the front panel are labelled as "Status", "RIS", "Diplexer 1" and "Diplexer 2". Either one of the diplexer leds is green indicating the active diplex filter set. The "RIS" led indicates remote communication status and the "Status" led indicates other possible alarms.

Status led	Description
 red	≥1 major alarm
 yellow	≥1 minor alarm
 green	No alarms
 dark	Software / CPU / power failure

RIS led	Description
 red	RIS connected, receiving "ingress off" command
 yellow	RIS connected, receiving "ingress att" command
 green	RIS connected, receiving "ingress on" command
 green blink	RIS connected but no commands received
 dark	RIS not connected

Transferring ACE2 settings

A “Settings Saver” DLL component for ACE2 is included in the latest DUS100 viewer packet release. It can be used with CATVisor Commander and CATVisor SmartLoader to transfer partial or complete device settings between a file and ACE2. This feature can be accessed through Commander > “Tools” > “Load/Save element configuration” when it has been activated with correct serial number.

The settings are stored as *.ECML files in XML format. These files can be also edited with standard text editors, provided that the XML tags and structure are maintained. Tags can be removed to create partial settings files.

The settings saver ECML files can also be edited in user-friendly format with an Excel tool. This tool can be downloaded from Teleste extranet (MyTeleste). The settings saver ECML files can also be used for specifying factory settings when ordering preconfigured ACE2 units.

ACE2 will draw power from the USB connector for its microcontroller and memory if no external power supply is available. This makes it possible to configure ACE2 settings and update the software without any power supply.

Note that as only the CPU part of the unit is powered via USB, many parameters visible via the user interface may display incorrect values.

Updating ACE2 software

New software versions for ACE2 are published at Teleste extranet (MyTeleste). These may contain bug fixes, enhancements and completely new features. For details see "ACE2 software release history" document also available in Teleste extranet (MyTeleste).

ACE2 software can be updated via USB using CATVisor. ACE2 stays fully operational during the update. The "Application updating" alarm is active during the update.

The new software is taken into use after it has been completely transferred and the device is reset. The reset takes a couple of seconds after which the device is fully functional and running the new software. If the download fails, ACE2 continues to use its previous software.

Viewer pages

The viewer pages used to control ACE2 using CATVisor Commander or EMS are explained in this chapter. For a complete description of each feature, see corresponding "Features" chapter.

ACE2 viewer pages in CATVisor Commander:

- Status
- Forward path
- Return path
- Transponder
- Properties

Some viewer pages have fields with coloured background, e.g. "Temperature" on "Status" page. These colours indicate the alarms related to this field. Green means no alarms or notifications; red is major alarm, yellow is minor alarm and blue is notification.

Status viewer page

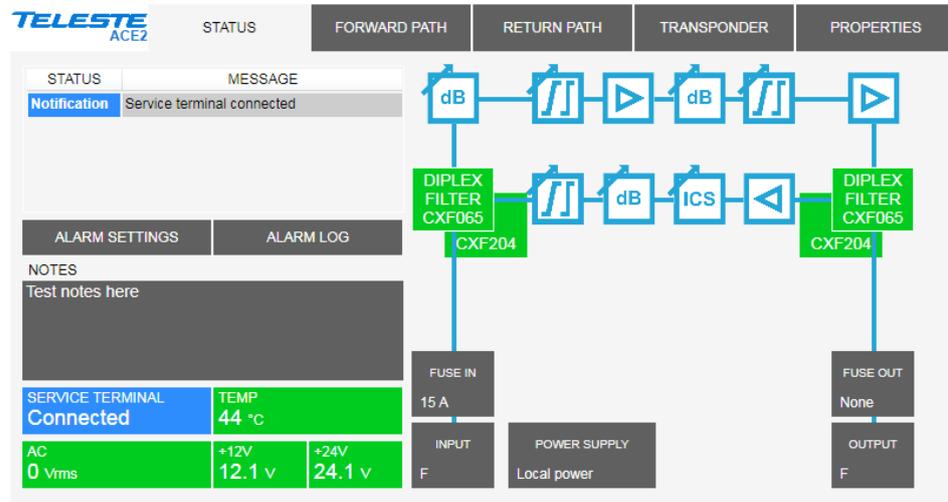


Figure 5. The Status page

The Status page displays unit's alarm list together with measurement data and a graphical view of the current configuration similar to the actual station layout.

Alarm list, settings and log

Each alarm in the alarm list on the top left corner is colour coded according to its severity. Alarm limits and severities can be configured through the "Alarm settings" dialog (see below), opened with "Alarm settings" button. The "Alarm history" dialog (see below) can be opened with the "Alarm log" button. For additional information about alarms, see table of module alarm descriptions in the "Features / Alarms" chapter.

Notes

The "Notes" field allows storing up to 200 character message into unit non-volatile memory.

Measurements

The background colour of each field shows the parameter's alarm status.

The "Service terminal" field shows whether there has been activity on the local USB service connector during the last minute.

ACE2's internal temperature is typically 10...25 degrees above ambient temperature depending on installation.

The "AC" voltage field shows true RMS value (DC+AC component) of the remote supply voltage. This value is calculated using sliding average and thus reacts quite slowly to changes. The factory default limit values are based on ACE2's power supply specifications and are thus quite broad. They should be adjusted to match the network's AC supply voltages if accurate monitoring is needed.

+12 V and +24 V factory default alarm limits are based on power supply specifications and usually shouldn't be altered.

Station layout

The diplex filter modules are detected automatically and represented as boxes with background colour reflecting alarm status. Some modules (fuses, connectors and power supply) cannot be detected automatically. These are

presented with grey boxes. Selecting a text tag representing a passive device will open a pull down selection list in which an appropriate device according to the assembly can be selected. The user can also type in the desired information (up to 12 characters, 6 characters for fuses). The information entered in these fields does not affect unit operation in any way; it's just a "checklist".

See "Features" chapter for details on plug-in modules and configuration.

Alarm settings dialog

The "Alarm settings" button on "Status" page opens the alarm settings dialog.

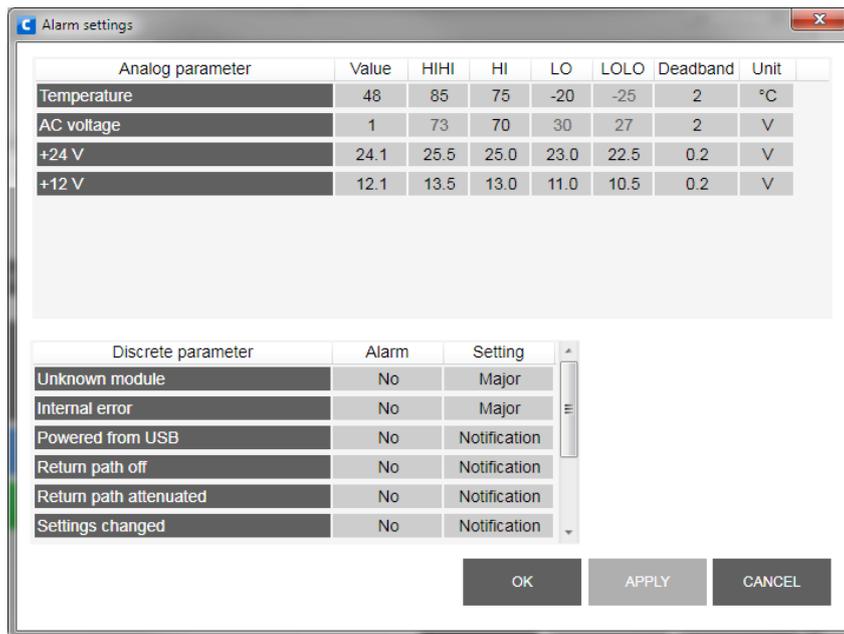


Figure 6. The Alarm settings dialog

The "Alarm settings" dialog displays all monitored parameters and their values as well as alarm limits, statuses and severity settings.

See "Features / Alarms" chapter for descriptions of individual ACE2 alarms.

Analog parameters

Each monitored analog parameter of the unit is displayed in the upper half of the dialog with the following information in the list:

Analog parameter: Name of the monitored parameter, with background colour indicating active alarm.

Value: Current measured value.

HIHI: High major alarm limit

HI: High minor alarm limit.

LO: Low minor alarm limit

LOLO: Low major alarm limit.

Deadband: Specifies how much the measured value has to be on the "safe" side of alarm limit before turning off the alarm.

Unit: Unit of the measured parameter.

The alarm settings can be configured by double-clicking an analog parameter name. This will open a dialog box with parameter's alarm limits and deadband.

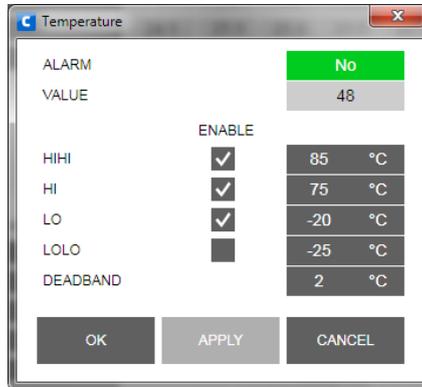


Figure 7. The analog alarm configuration dialog box

Each alarm limit can be individually enabled/disabled and configured. The alarm limits should be in decreasing order for correct alarm processing, preferably with more than "Deadband" units between each limit.

Discrete parameters

Each monitored discrete parameter of the unit is displayed in the lower half of the dialog with the following information in the list:

Discrete parameter: Name of the monitored parameter, with background colour indicating active alarm.

Alarm: Alarm status of the parameter: No / Notification / Minor / Major. If the alarm is disabled, but parameter is in alarming state, "Yes" is shown.

Setting: Alarm severity can be configured to Major, Minor, Notification or Disabled.

The alarm severity setting is user configurable by double-clicking a discrete parameter name. This will open a dialog box which can be edited by users with at least "Service" level user rights. For others this is read-only information.

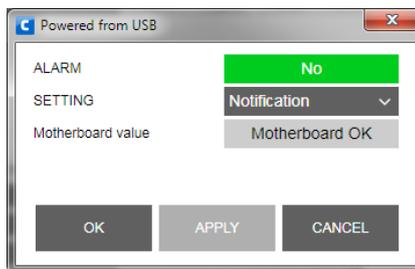


Figure 8. The discrete alarm configuration dialog box

Alarm log dialog

The "Alarm log" button on "Status" page opens the alarm log dialog.



Figure 9. The Alarm log dialog

The "Alarm log" dialog box displays the alarm history for latest 64 events. The list is stored in non-volatile memory. All entries are date and time stamped with the most current entry at the bottom. Note that date/time information may not be correct for events that occurred before latest reset.

The total number of entries in the alarm log list is shown in the "Number of entries" field. The index number of the last entry is displayed in the accompanying field. Total number of entries is limited to 64. The oldest entry is overwritten when the log becomes full.

To save "Alarm log" page to a file, click the "Save" button.

The "Clear and regenerate" button clears log and restarts alarm detection.

Forward path viewer page

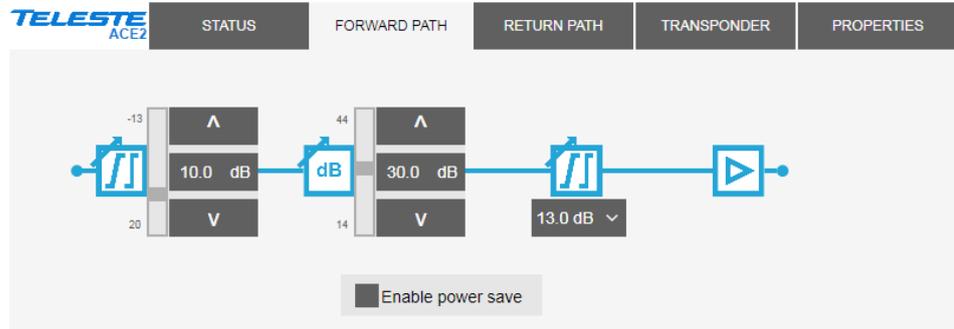


Figure 10. The Forward path page

The Forward path page displays all settings related to forward path adjustment. See “Forward path” chapter for details.

Gain, slope and total gain adjustments

Input slope, total gain and interstage slope can be adjusted by clicking the up and down buttons or typing a value into the fields. The slider indicates relative position of the control to its limits.

Input slope control includes a cable simulator which is automatically activated when input slope is negative. When the cable simulator is activated, the gain is reduced by 13 dB.

Power save

Power save can be enabled to save ~2 W without effect on RF performance when used RF levels are at least 3 dB below maximum levels.

Return path viewer page

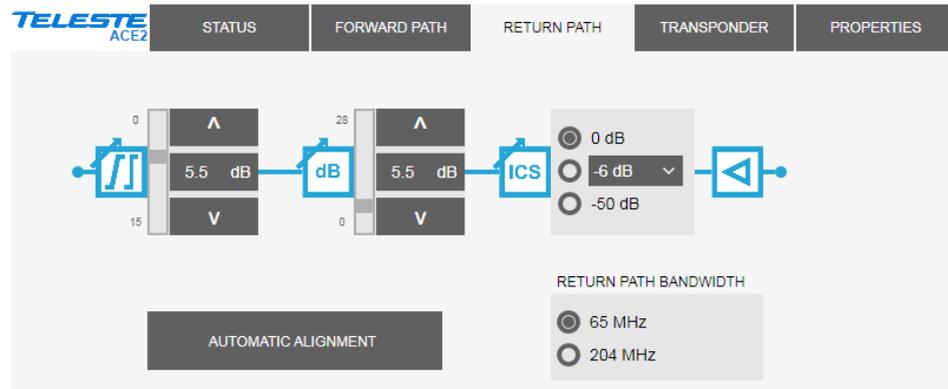


Figure 11. The Return path page

The Return path page displays all settings related to return path adjustment.

Gain and slope

The gain and slope controls can be adjusted in 0.5 dB steps by clicking the up and down buttons or typing a value into the fields. The slider indicates the relative position of the control to its limits.

Ingress switch

The radio buttons are used to control the ingress switch. The “-50 dB” selection cuts off the incoming return path RF signal and thus also disconnects all cable modems and transponders behind this unit.

The ingress switch attenuation value can be adjusted between -10...-3 dB.

Return path bandwidth

The radio buttons are used to control the diplex filter set selection, indicated also with ACE2 front panel LEDs. New settings for return path gain and slope are calculated automatically when new diplex filters are taken into use.

Automatic alignment

Clicking the “Automatic alignment” opens a dialog box (Figure 12).

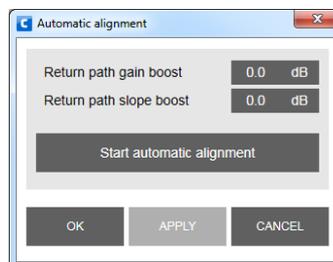


Figure 12. Automatic alignment dialog.

The “Return path boost” values are added to the calculated return path gain and slope values and can be used to fine-tune automatic alignment. This can be useful e.g. in cases where forward path output levels are different than in previous amplifier. Clicking “Start automatic alignment” takes the boost settings into use and adjusts return path gain and slope according to forward path.

Transponder viewer page

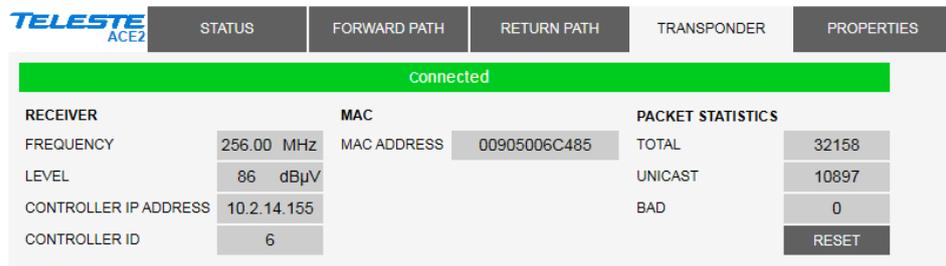


Figure 13. The Transponder page

The “Transponder” page displays read-only status information on the RIS communication. See “Remote communication” chapter for details.

Connection status

The communication status of the transponder is shown in top of the page:

- **Scanning:** Searching for the RIS carrier.
- **Locked:** Locked to RIS carrier, no commands received in last 2 minutes.
- **Connected:** Locked to RIS carrier, commands received in last 2 minutes.

Receiver

The “Frequency” field shows the used receiver frequency.

The “Level” field shows the measured signal level at transponder input.

The “Controller IP address” and “Controller ID” fields show the identification data received from the RIS controller.

MAC

The “MAC address” is the unit’s unique, read-only hardware address that is also printed on the front panel sticker.

Packet statistics

The “Total” field displays the total number of received RIS packets.

The “Unicast” field displays the number of RIS packets addressed to this unit.

The “Bad” field displays the number of all bad packets received.

Packet counters wrap around at 65535, so absolute values are not meaningful.

The "Reset" button will reset all packet counters to zero.

Properties viewer page

TELESTE ACE2		STATUS	FORWARD PATH	RETURN PATH	TRANSPONDER	PROPERTIES
IDENTIFICATION		ADVANCED FUNCTIONS				
NAME	PeltMi testilaite			SPECTRUM ANALYSER	N/A	
LOCATION	PeltMi positio			INGRESS ANALYSER	N/A	
CONTACT	PeltMi			AUTOMATIC ALIGNMENT	N/A	
COORDINATES	NORTH	EAST	FORMAT	RETURN PILOT GENERATOR	N/A	
	60°26.600'	22°22.370'	dd°mm.mmm'			
SAVE RIS INFO						
PROPERTIES		STATION		TRANSPONDER		STATISTICS
TYPE	ACE2		Built-in RIS		UPTIME	0 d 00:00:12
HARDWARE VERSION	E1.4		N/A		TOTAL UPTIME	11 days
SERIAL NUMBER	KK30211721		N/A		RESET COUNT	40
SOFTWARE VERSION	1.6.8		N/A		SAVE DEBUG INFO	
FOSS LIST						

Figure 14. The Properties page

The “Properties” page displays unit identification and statistics data.

Identification

A descriptive alias name for the station can be entered into the “Name” field, site location into “Location” field and contact information into “Contact” field. All these fields can contain up to 63 characters.

The geographical coordinates can be entered into respective latitude and longitude fields. The preferred format for the coordinates can be selected from the "Format" drop-down field. When entering coordinates, special characters (°/'") can be simply omitted.

Properties

The type, hardware version, serial number and software version are shown.

Statistics

The “Uptime” field shows the time since the last reset or power up. The format is days, hours, minutes and seconds, with ±5 s/day accuracy.

The "Total uptime" field shows the total number of full operating days.

The "Reset count" field shows the total number of resets.

The "Save debug info" button reads the unit's non-volatile memory contents and opens a dialog for saving it into "devicetype-serial-date.fun" file which can then be sent to Teleste support to help troubleshooting problems.

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Free and open source software components (FOSS LIST)

"rsnewlib", RedSuite (FULL) newlib: <http://www.code-red-tech.com/RedSuite5/red-suite-5.php>
"f4usb", STM32F4xx USB xxx Library: MCD-ST Liberty SW License Agreement V2:
http://www.st.com/software_license_agreement_liberty_v2
"freertos", FreeRTOS: modified GPL: <http://www.freertos.org/a00114.html>
"dspic", MPLAB X (free edition): <http://www.microchip.com/pagehandler/en-us/family/mplabx/#documentation>
"redlib", RedSuite (FULL) redlib: <http://www.code-red-tech.com/RedSuite5/red-suite-5.php>
"dspic", MPLAB X (free edition): <http://www.microchip.com/pagehandler/en-us/family/mplabx/#documentation>
"steeprom": <http://www.st.com/web/catalog/tools/FM147/CL1794/SC961/SS1743/PF257846>
"cdc": UART to CDC Modem Sample Application: <http://www.ftdichip.com/Firmware/Precompiled.htm>

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