



TC-430

User manual

Document chronology

Version	Date	Issuer	Description
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1.4.0-A	05/04/2016	MR	<ul style="list-style-type: none"> - Added caps-lock management; - Added the description of the wireless adapter configuration; - Added networking diagnostics; - Added devices failure messages; - Added protocol KC-2S-U description; - Added info about the device serial number; - Fixed some typos and improved some sections.
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1.96.0-A	06/06/2018	MR	<ul style="list-style-type: none"> - Added HTTP interface for handling system data - Added description of lockout mode (energy saving)
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1. Overview

Aesys® TC-430™ is the brand new on-board control unit to be used for managing Aesys® LED signs and vocal announcement equipments in “route/destination” mode.

The control unit supports LED signs currently supported and it fully controllable by remote using Aesys® Verba 2014™ [1] and AVBUS/AVBUST2-compatible vocal announcement equipments (for current destination announcement).

TC-430™ implements a 4.3” (480x272) touch-screen and a soft-touch physical keypad (Figure 1). All control unit functions are accessible by using both the touch-screen and the physical keypad.



Figure 1: System overview

The keypad comprises alphanumeric keys, general purpose keys (ok, cancel, up/down arrows) and 5 programmable “soft keys” whose functions depend on the application context and are described on the touch-screen within the “soft keys functions” area.

Aesys logo key has no function at the moment.

TC-430™ keypad colorization may be changed for matching user preferences (see paragraph 9.9.6); furthermore the color of the keypad changes accordingly to the application context.

Touch-screen and keypad brightness is dimmed when the system is not interacted by the user for a configurable interval of time (see paragraph 9.9.3).

The upper part of the touch-screen is used for showing the “status bar”, that is a collection of icons and labels which is used for reporting the current status of the system (see paragraph 6.).

2. Keypad usage

Several characters/functions are associated with most of the keys of the keypad. Table 1 shows the full list of available keys.

Key	Functions
1	1, Caps-lock
	2, A, B, C
	3, D, E, F
	4, G, H, I
	5, J, K, L
	6, M, N, O
	7, P, Q, R, S
	8, T, U, V
	9, W, X, Y, Z
	0, Space
	/ . , + - _
	Arrow up
	Arrow down
	Ok
	Cancel

Table 1: Keypad key functions

While pressing a keypad key having several functions, then the set of accessible characters appears on the touch-screen (Figure 2).

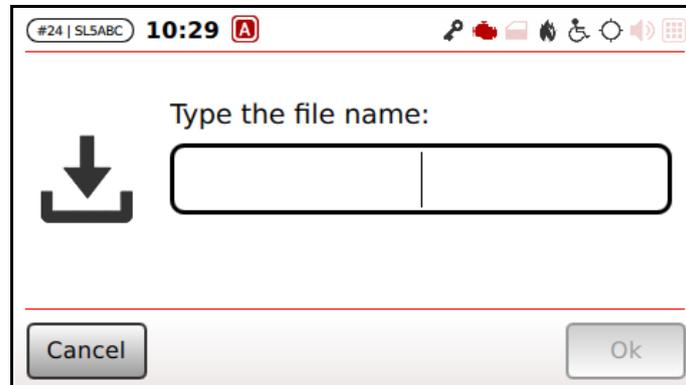


Figure 2: Keypad usage

Repeatedly pressing the keypad key gives access to all the characters/function of the key (the current character is highlighted and appears in the current input box). Accessible characters can be simply selected also tapping them on the touch-screen.

If the same character/digit has to be typed twice, then the user has to pause to confirm the first character before pressing again the same key for typing the second character (until characters selection disappears from screen). Alternatively it is possible to immediately confirm the first character by pressing  and then proceeding with the next one.

It is possible to delete the last typed character by simply pressing ; if no characters are left to be deleted, then  usually cancels the current operation.

A proper icon shown in the status bar (see paragraph 6.) tells whether caps-lock is enabled or not (respectively  or ). Caps-lock can be toggled by holding the key  for about one second.

Some TC-430™ functions (also depending on configuration) may require the keypad to be turned in “numeric-only” mode. In this scenario the icon  is shown in the status bar and the keypad can be used for typing digits only.

3. Soft keys usage

TC-430™ comes with 5 programmable “soft keys” whose functions depend on the context of the application. The current function of soft keys is shown in the bottom area of the touch-screen.

Every soft key can have up to two distinct function (the so-called “primary function” and “secondary function”).

Both functions are reported on the soft keys description area in the touch-screen, the secondary function being written smaller). Soft keys having a secondary function are marked with a ticker bottom border.



Figure 3: Soft keys

Looking at Figure 3, for example, the leftmost soft key has two functions (“Dest A” as primary function and “Set” as secondary function) while the central soft key has one function only (named “Inversion”).

The primary function of a soft key is accessed by simply pressing the soft key (or tapping its description on the touch-screen) while the secondary function is accessed by holding the soft key (or by tapping and holding its description on the touch-screen). While holding a soft key which has a secondary function, an animated blue bar is shown over the soft key description, in order to provide a feed-back to the user of the on-going process. Once the animation completes (the bar fills the soft key description) then the secondary function of the soft key is fired (Figure 4).



Figure 4: Holding a soft key

If the soft key is released before the animation completes, then the action is cancelled.

4. Menu usage

Some features of the TC-430™ control unit is accessible by the means on hierarchical menus. An example of a menu can be show by simply pressing “*Menu*” on the main screen (Figure 5).

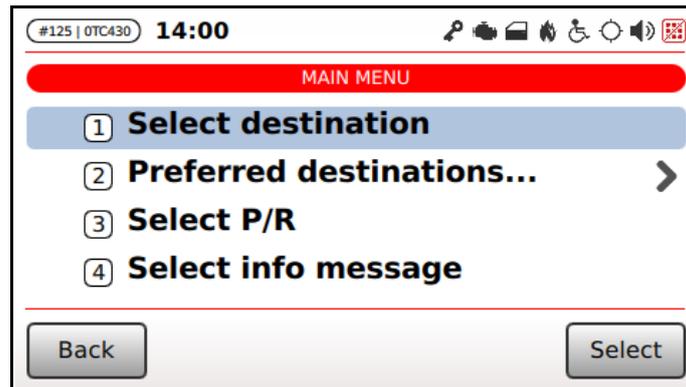


Figure 5: Menu usage

Menu entries can be reviewed by vertically sliding on the touch-screen or using the arrow up/down keys on the keypad.

The current menu entry is highlighted on the screen and can be selected just by tapping on it or pressing “*Select*”.

Alternatively a menu entry can be selected just by typing the corresponding number on the keypad (only available for menu entries numbered from 1 to 9); it is also possible to directly access the menu entry numbered 10 by typing the key 0 on the keypad.

Menu entries whose description ends with an ellipsis (also marked by **>**) give access to a sub-menu (when such a entry is selected the “*Select*” soft key gets labeled “*Enter*”).

“*Back*” / “*Move up*” soft keys respectively leave the menu and move to the parent menu.

5. System messages

TC-430™ reports the status of some operations by the means of system messages. A system message is a message that appears on the touch-screen and which may require some interaction with the control unit user.

If the control unit needs to communicate several messages to the user, then all the messages are queued-up and shown one-by-one, so that the user can review all of them and take corresponding actions.

Some messages are just informative messages, and remain on screen for a limited period of time. In such a case a progress bar is shown under the message: as soon as the progress bar fills-up the screen, the message is automatically dismissed by the system (Figure 6). Anyway the user can manually dismiss an informative message just by pressing on “Dismiss”.

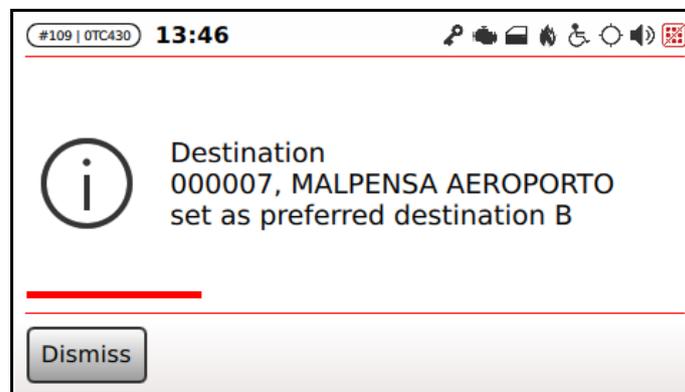


Figure 6: Informative system message

Error messages and critical messages require the user attention, and so are not automatically dismissed by the system. Instead the user has to manually press on “Dismiss” (or take another suggested action) for acknowledging the system about the receipt of the message (Figure 7).



Figure 7: Critical system message

6. System status

The current status of the system is reported by the status bar in the upper part of the screen (Figure 8).



Figure 8: Status bar

Table 2 describes all the parts composing the status bar.

Icon	Description	Reference
	The icon reports the current data level and the current unit profile being used by TC-430™. The current data level and the current unit profile is available only if TC-430™ was loaded with a VDB file; if a TRX file was loaded instead only the label “TRX” is shown by the icon. The icon is missing if no data files have been loaded into the system. If the icon is blinking then it means that there are upcoming data updates to be processed (data updates can be processed only while the control unit is idling, meaning that no destination, P/R, info, route number and dash signs messages are selected nor any navigation activity is on-going). Please refer to [1] for further details about data levels and unit profile.	§7.1.1
10:01	Current clock	§9.2
	Caps-lock enabled / disabled	§2.
	Numeric mode keypad enabled	§2.
	Wireless connection status (only shown when the bus is under network coverage)	§8.8
	Server connection status (only shown when the bus is connected to the station server)	§8.9
	Authorization key (red if an authorization key has been detected; a small plus (“+”) appears next to the icon if the key has been used for recognizing a driver)	-
	Engine status (grayed out if the engine is off)	-
	Doors status (flashing red if doors are open)	-
	Emergency button status (flashing red if emergency mode is active)	§11.1

	Wheelchair lift status (flashing red if the wheelchair lift is active)	-
	GPS status (appears as  if a valid GPS fix is not available)	§8.7
	Vocal announcement equipments status (flashing red in case of troubled equipments; “slashed” if some equipments are muted)	§8.4
	LED signs status (flashing red in case of troubled signs; “slashed” if some signs are blank due to power saving; the icon shows a blinking red/yellow background if some displays report self-diagnostic problems)	§8.3
	LCD screens status (flashing red in case of troubled screens)	§8.5

Table 2: Status bar description

7. Basic functions

The basic functions of the TC-430™ are presented in a slightly different way depending on the “system mode” (see paragraph 9.9.2 for further details about the mode).

Paragraph 7.1 covers basic tasks which are common to all system modes, whereas paragraph 7.2 if referred to the “Route/destination” mode whilst paragraph 7.3 is devoted to “NextStop” mode.

7.1 Common

7.1.1 Driver login

Depending on the data file available on the system (see [1] for further details about that) the control unit can be configured for requesting the driver to login (providing his own identification code and password) before being able to interact with the system (except some very basic operations).

If driver login is requested, then system main screen is as represented in Figure 9. The driver can login by pressing the button “Login” or by selecting “Menu → Service menu → Login”.



Figure 9: Login requested

Login is made providing driver own identification code and password, as seen in Figure 10. Please refer to [1] for further details about driver definition in Verba 2014™.

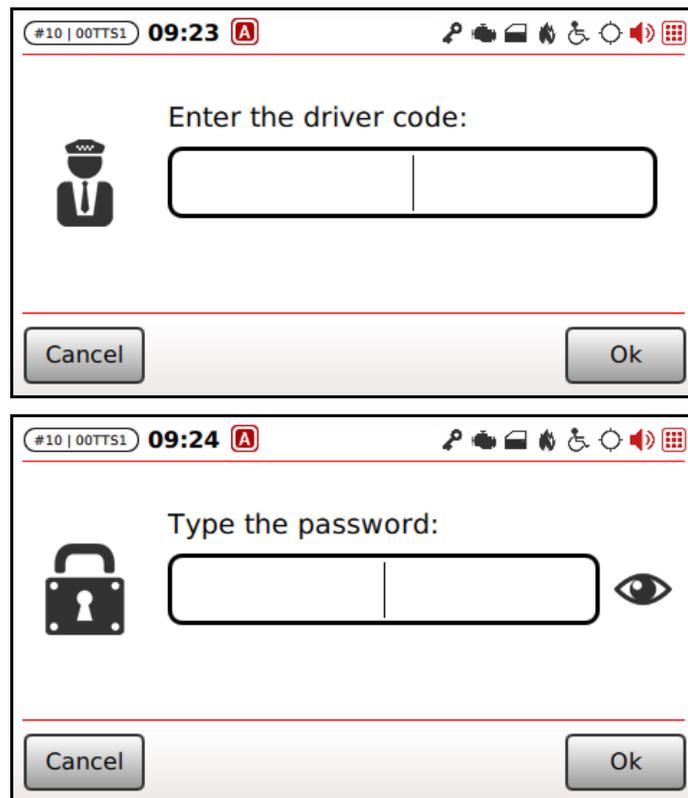


Figure 10: Driver login

Heading zeroes can be omitted while typing the driver code (so if the driver code is “00001” then simply “1” can be typed).

Once the login procedure is complete, the code of the logged driver is reported on TC-430 main screen, as in Figure 11.

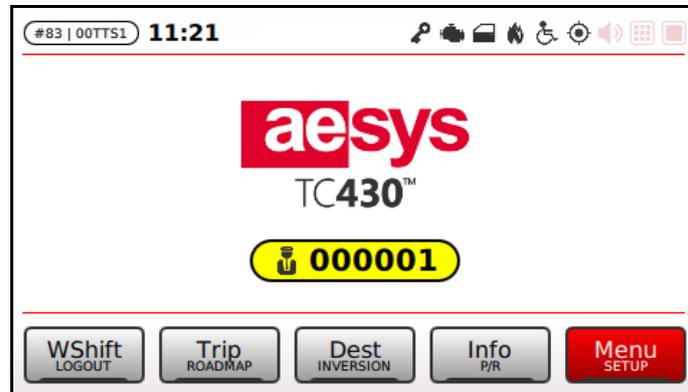


Figure 11: Driver login feed-back

Driver logout can be performed by simply selecting the “Logout” function or selecting “Menu → Service menu → Logout”.

Driver credentials can also be supplied via USB key. In such a case the USB key must be prepared by using Aesys® Verba 2014™ exporting the driver identification file (please refer to [1] for further details). Having the USB key prepared, driver credentials are provided by connecting the USB key to the system. Driver logout in that case is performed by simply removing the USB key from the system.

7.1.2 Data loading

A data file, specifying the archive of messages and the configuration of the system, has to be loaded into TC-430™ before operating the control unit on the road.

The data file is produced by Aesys® Verba 2014™ (see [1] for further details about that) and can be either a VDB or a TRX file (the former being the preferred choice and the latter supported just for backward compatibility with old systems).

The data loading is started just connecting a USB key to the control unit. The screen in Figure 12 is shown.

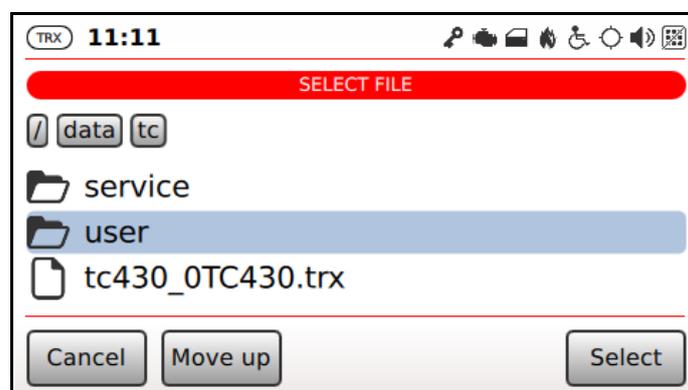


Figure 12: Data file selection

The procedure for loading a new data file into the system can also be started selecting “*Menu → Load data file*” from the main screen.

The file list can be scrolled by sliding the touch-screen, or using the arrow up/down button of the keypad.

Folders can be entered by selecting them and pressing “*Select*”, and can be left (upward) pressing “*Move up*” button. It is also possible to navigate the folders hierarchy by simply tapping the name of an open folder in the bar above the files list (the bar can be slid horizontally if it does not fit on the screen).

The selected data file is loaded into the system pressing “*OK*”.

If the file being loaded is a complete VDB file or a TRX file, then it is immediately applied (the new data level and unit profile specified by the file is shown in the status bar). If the file being loaded is a differential VDB file then its activation is delayed until the activation date/time specified within the file itself has elapsed (it is immediately activated if the activation date/time occurs in the past).

If an error occurs during the data file processing, then a proper message is shown by the control-unit.

**Be aware!**

A new data file cannot be processed until there is some active service on the TC-430™. Please abandon any current service (destination, P/R, info message, dash message, workshift, roadmap, trip) for allowing the processing of upcoming data updates.

7.1.3 Media loading

A media package is an archive containing some media files (video) to be published by LCD screens connected via network to the control unit (see paragraph 7.1.6). A media file is basically a ZIP file containing media files.

For loading a new media package to the control unit, the same procedure explained for data loading (see paragraph 7.1.2) can be followed simply selecting a media package instead of a data file.

This applies either for uploading files containing multimedia files, Aesys® MultimediaEditor™ (MME) packages or Aesys® Creo™ channel packages.

7.1.4 System lockout (energy saving)

If the bus engine is off, the system turns to lockout mode after 3 minutes from the last user interaction (or from the bus engine switch-off if no interactions take place).

In lockout mode the LCD screen and the keyboard backlight is turned off and any further user interaction with the system is prevented; only the “Aesys” button remains active and its coloration turns to green, just to make clear that the system is in energy-saving mode (see Figure 13).



Figure 13: Lockout mode (energy saving)

The lockout mode can be abandoned simply switching back on the bus engine. Alternatively TC-430™ temporarily leaves lockout mode (for other 3 minutes since last user interaction) by pressing the “Aesys” button on the keypad; this feature can be useful for just interacting with the system (e.g. for maintenance purposes) even if the bus engine is off.

**Attention!**

If the system enters lockout mode while within the administrative setup menu (see paragraph 9.) then the administrative setup is automatically left.

7.1.5 Service idling

The service is said *idling* if there is a valid current service (destination, P/R, route, dash message, info message, workshift, roadmap, trip) but the bus engine has been switched-off since 3 hours.

In such a case, the service is automatically reset by the system in order to let the system to process pending data updates (if any) whose elaboration is prevented by the presence of an active service (see paragraph 7.1.2).

7.1.6 Media files selection

TC-430™ can manage LCD screens connected to it via network. The configuration of available LCD screens is done by the means Verba 2014™ (refer to [1] for further info) and their list is made available to the control unit by uploading a proper data file (see paragraph 7.1.2).

LCD screens can be commanded to show any (a list of) media previously uploaded to the control unit as explained in paragraph 7.1.3. The list of available media is shown by selecting “Menu → Service menu → Select media”. The screen in Figure 14 is shown.

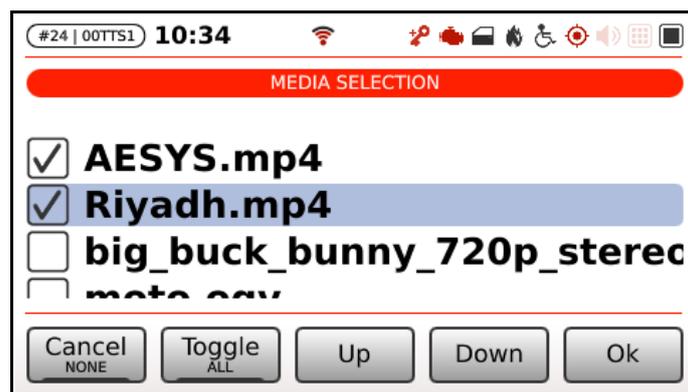


Figure 14: Media selection

A media file is selected/deselected by clicking on the checkbox next to its name and/or by pressing “Toggle”. Soft keys “None” and “All” respectively select no files or all the available files; “Up” and “Down” are used to move items up or down in the playback sequence.

Selected media files are sent to LCD screens for playback on “Ok”. If no files are selected at all, LCD screens show a standard page (the content of the page depends on the LCD screens configuration).

7.2 Route/destination mode

While in *Route/destination* mode, the TC-430™ allows the direct control of all the on-board signs, whose content has to be manually selected by the bus driver.

Figure 15 shows the main screen of TC-430™ while in *Route/destination* mode: soft keys report the most important functions offered by the active mode (all remaining functions can be accessed via “*Menu*” button).

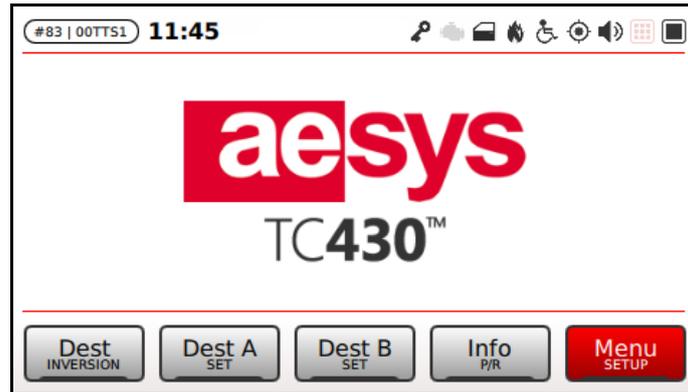


Figure 15: “Route/destination” mode main screen

7.2.1 Destination selection

The list of available destinations is accessed by pressing any alphanumeric key or the up/down arrow keys on the keypad from TC-430™ main screen (Figure 16).



Figure 16: Destination selection

Destinations list can be accessed also selecting “*Menu* → *Service menu* → *Select destination*” from the main screen.

Every destination has a code and a description. The description can be slid horizontally (by dragging it on the screen) to read it entirely if it does not fit on the screen.

A destination is selected by sliding the list vertically on the touch-screen or by using the arrow up/down buttons on the keypad. The selection is confirmed by pressing “OK”.

Destination selection can be cancelled by pressing “Cancel”.

The list can be filtered by code or description, for quickly locating the desired destination. The active filter mode is highlighted in the soft keys description bar (“Code” for filtering by code, and “Descr” for filtering by description). Filter mode can be changed by pressing the soft key corresponding to the desired mode.

Destinations are sorted by code or by description depending on the current filtering mode.

A filter is applied by typing the desired text. So, for example (Figure 17), while “Code” filtering mode is active, typing “19” shows all the destinations whose code contains the string “19”.



Figure 17: Filtering destinations

The filter is applied as soon as the last typed filter character is confirmed (as usual  can be pressed for quickly confirm the last character).

The active filter is shown in the upper part of the screen.

An active filter can be modified by simply typing a new filter (just press  repeatedly until the filter is empty for completely disable list filtering).

Changing filtering mode (from “Code” to “Descr” or viceversa) resets the previous active filter.

The filter is retained by the system: if the destination list is accessed again, the last used filter mode and filter text are proposed by default.

If the destinations list is accessed from TC-430™ main screen by typing an alphanumeric character on the keypad, then the pressed key is taken as a part of the filter (considering the last filter mode selected by the user). This feature is really useful if the bus driver already knows, for example, the code of the destination to be selected, because in such scenario the driver can quickly select the desired destination by simply starting to type its code on the main screen and then confirm the selection).

Once a destination is confirmed, then it is reported on the TC-430™ main screen (Figure 18).



Figure 18: Current destination selection

If a warning icon  appears next to the current destination label (Figure 19), then it means that the current destination is not available for at least one LED sign (the corresponding LED sign is not going to publish the current destination). The problem can be fixed by simply implementing the missing resource (the selected destination on the correspondent sign) in Aesys® Verba 2014™ [1].

Further details about missing destination resources, can be accessed looking at displays diagnostics, as described in paragraph 8.3.

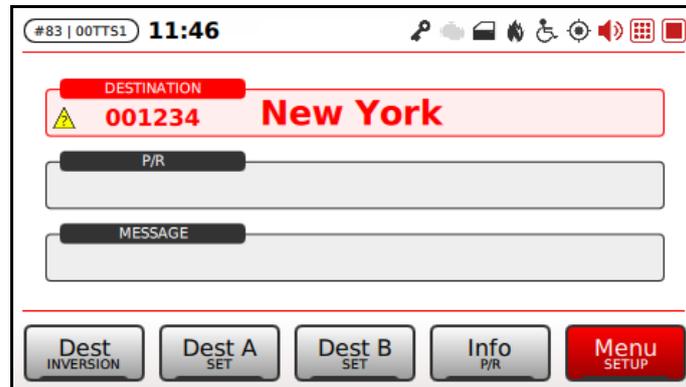


Figure 19: Missing destination

The current destination can be cleared by selecting “Clear” in destinations selection list. Alternatively the current destination can be cleared also by selecting “Menu → Service menu → Clear signs” or by pressing  in the TC-430™ main screen). The screen in Figure 20 is shown.

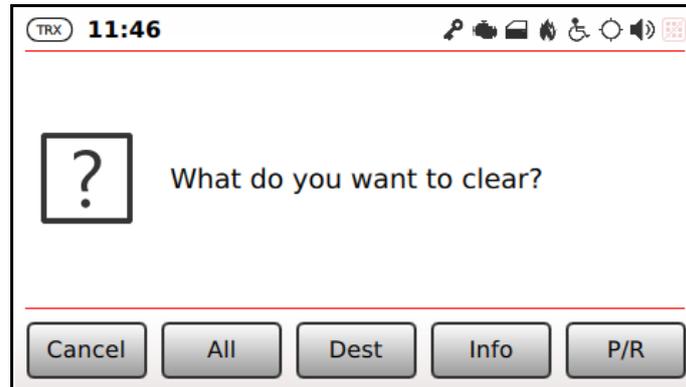


Figure 20: Signs clearing

“All” clears all the selected resources (destination, info message and P/R message), while “Dest”, “Info”, “P/R” respectively clears the current destination, the current info message and the current P/R message (see paragraphs 7.2.2 and 7.2.6 respectively for details about info messages and P/R messages).

The current destination is automatically broadcasted to all external LED signs managed by the TC-430™ and it is also used for properly driving the vocal announcement equipments.

If no destination is currently selected then external LED signs are turned blank.

7.2.2 Preferred destinations

TC-430™ allows the definition of a couple of destinations as the “preferred” destinations. The selection of preferred destinations is very quick and can be made by simply pressing the soft keys labeled “Dest A” and “Dest B” from the main screen (or alternatively by selecting “Menu → Service menu → Preferred destinations → Preferred destination A” or “Menu → Service menu → Preferred destinations → Preferred destination B”).

The configuration of preferred destinations is made by pressing “Set” (secondary function of the corresponding soft key) on the main screen (or alternatively by selecting “Menu → Preferred destination → Select preferred destination A” or “Menu → Service menu → Preferred destination → Select preferred destination B”).

If no destination is currently active (see paragraph 7.2) the destinations selection list is shown: the destination selected by the user is then set as the preferred destination (A or B).

If a destination is currently active, then it is also possible to set the current destination as the preferred destination. The screen in Figure 21 is shown. Pressing “Current” the current destination is set as the preferred destination (A or B) while pressing “Pick” the list of available destinations is shown for allowing the user to select the desired destination as the preferred destination (A or B).

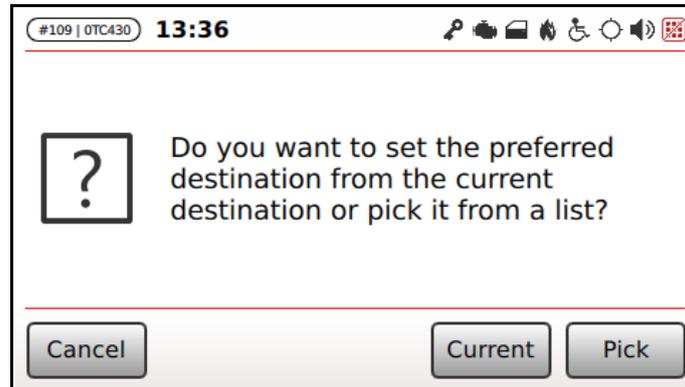


Figure 21: Preferred destination selection

If the preferred destination settings gets changed somehow, the control unit notifies that through a proper message appearing on the screen (Figure 22).



Figure 22: Notification of change in preferred destinations selection



Be aware!

Preferred destinations are stored as an association with some destinations contained in the current data file being used by the system. If a new data file is loaded into the system, then TC-430™ tries to preserve preferred destinations selection at its best, but may give up if saved preferred destinations are available no more in the new data file. In such case preferred destinations selection has to be performed again.

7.2.3 Default destination

Aesys® TC-430™ by default takes the destination coded "000000" as the "default destination" that is the destination which is automatically shown by the control unit at system startup and the destination which is commanded on external LED signs when the destination is cleared by the user (as described in paragraph 7.2.1) or by the system itself (e.g. while terminating a trip in stop/next-stop mode, as described in paragraph 7.3).

The rationale behind that is the following: when the system needs to clear the current destination, if a destination coded "000000" is available within the current data file than that destination is commanded on external LED signs, otherwise LED signs are simply blanked.

Code “000000” should be acceptable for the most users/companies as the default destination code. Anyway that can be tweaked modifying the TC-430™ configuration (please refer to Aesys® customer service for further details about that).

7.2.4 Inversions

An inversion is an association between two destinations, which tells that a destination is the opposite of the another one.

Inversions definition is made using Aesys® Verba 2014™ [1] and it is stored in the data file being loaded by the control unit.

The current destination can “inverted” (that is its “opposite” can be recalled) by simply pressing “*Inversion*” on TC-430™ main screen. If the current destination can be “inverted”, then the opposite destination is set as the current destination; otherwise the operation produces no effects.

The feature could be really useful for handling scenarios in which a destination represent the terminus of a service line and the opposite destination represents the destination corresponding to the other terminus of the line. Bus shuttles continuously serving the same line can quickly switch their destination by simply pressing “*Inv*” on the main screen.

7.2.5 Info messages

Info messages are intended for publication on internal LED signs and are generally used for share with passengers relevant notices or info about the service offered.

The list of available info messages is accessed by selecting “Info” from the TC-430™ main screen or by selecting “*Menu* → *Service menu* → *Select info message*”. The screen in Figure 23 is shown.



Figure 23: Info message selection

Info message selection, filtering, confirmation and clearance follows the same directions described in paragraph 7.2 regarding destination selection.

Once an info message is confirmed, then it is reported on the TC-430™ main screen (Figure 24).



Figure 24: Current info message selection

The current info message is automatically broadcasted to all internal LED signs managed by TC-430™. If no info message is currently selected then internal LED signs are turned blank.

7.2.6 P/R message

P/R messages (public relation messages) are intended for publication on external LED signs. External signs alternately show current destination (if any) and current P/R message (if any).

The list of available P/R messages is accessed by selecting “P/R” from the TC-430™ main screen or by selecting “Menu → Service menu → Select P/R message”. The screen in Figure 25 is shown.



Figure 25: P/R message selection

P/R message selection, filtering, confirmation and clearance follows the same directions described in paragraph 7.2 regarding destination selection.

Once an info message is confirmed, then it is reported on the TC-430™ main screen (Figure 26).

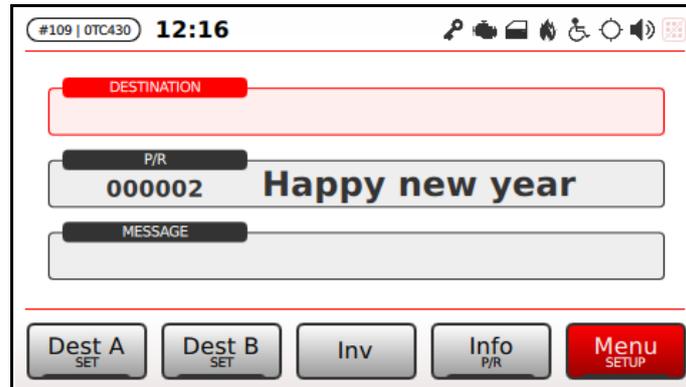


Figure 26: Current P/R message selection

The current P/R message (if any) is automatically broadcasted to all external LED signs managed by TC-430™ and its visualization is alternated to the current destination.

The time period for destination and P/R message alternate publication is set by the data file being used by system (it can be tweaked by using Aesys® Verba 2014™ [1]). It defaults to 4 seconds.

7.2.7 Route number

If route managed has been enabled (see paragraph 9.9.3) then it is possible to select the current route number by selecting “Route” on TC-430 main screen or by accessing “Menu → Service menu → Select route” (Figure 27).

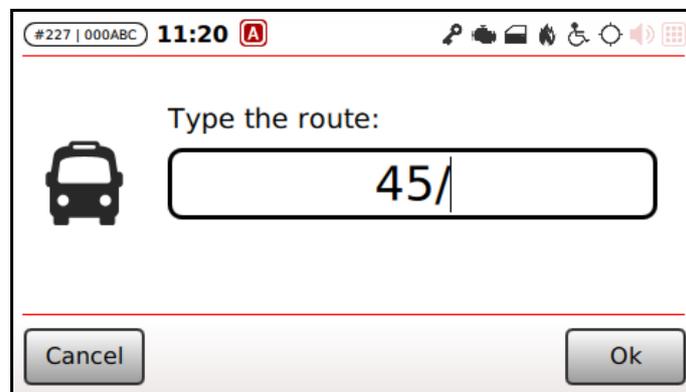


Figure 27: Current route selection

The current route number can be cleared by simply typing an empty string.

When the current route number is confirmed, then it is reported on the TC-430™ main screen (Figure 28).

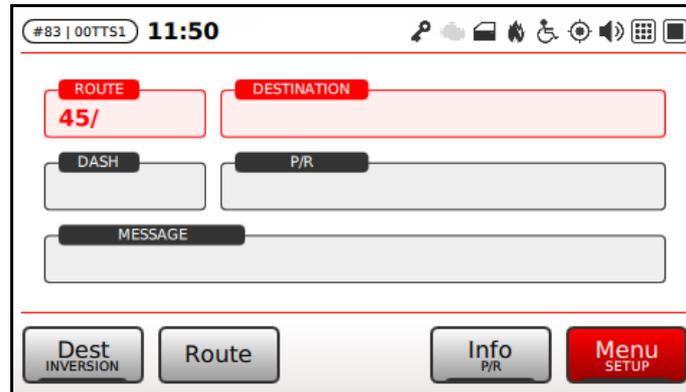


Figure 28: Current route selection

The current route number (if any) is automatically replaced to the route character (see paragraph 9.9.3) for all destination signs.

7.2.8 Dash sign message

If the dash sign has been enabled (see paragraph 9.4.5) then the message to be shown by the dash sign can be selected by accessing "Menu → Service menu → Dash sign message" (Figure 29).



Figure 29: Dash sign message selection

The dash sign message can be cleared by simply typing an empty string.

When the dash sign message is confirmed, then it is reported on the TC-430™ main screen (Figure 30).



Figure 30: Dash sign message selection

7.3 NextStop mode

While in *NextStop*, the TC-430™ is normally used for recognizing a given path or an entire service (a trip, a roadmap or a workshift).

Figure 31 shows the main screen of TC-430™ while in *NextStop* mode: soft keys report the most important functions offered by the active mode (all remaining functions can be accessed via “Menu” button).

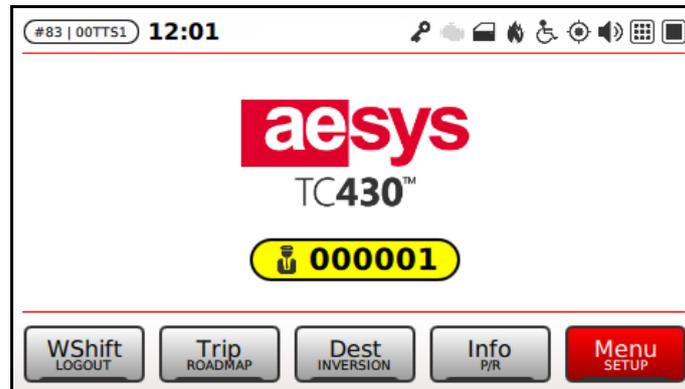


Figure 31: “NextStop” main screen

Typical functions of *Route/destination* mode (see paragraph 7.2) are also accessible while in *NextStop* mode, via “Dest”, “Inversion”, “Info”, “P/R” soft keys on main screen or via “Menu” button (for all other functions).

7.3.1 Service selection

The service to be executed by the bus can be selected by choosing a workshift, a roadmap or a single trip (please refer to [1] for further details about service definition) or a simple path.

A workshift is selected by pressing “WShift” or selecting “Menu → Service menu → Select workshift”. The list of workshifts available in the current day is shown on screen (Figure 32).

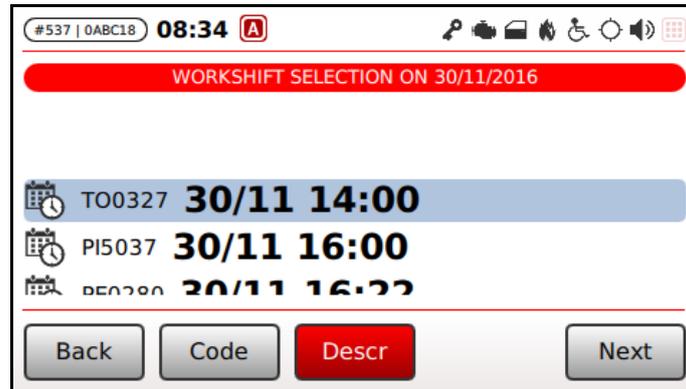


Figure 32: Workshift selection

Workshifts are listed by “time proximity”, the nearest one being selected by default. However selection can be filtered/sorted by code and/or description using buttons “Code” and/or “Descr” and typing the part of the code/description to filter for using the TC-430™ keyboard.

When a workshift is selected, the view is exploded into the trips composing the workshift (Figure 33).

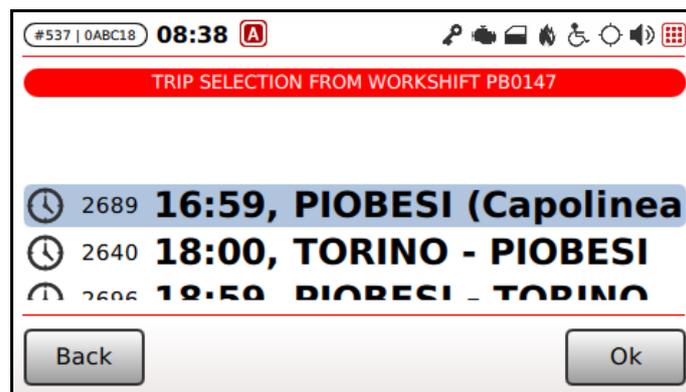


Figure 33: Service trip selection

Trips are also listed by “time proximity”, the nearest one being selected by default. Once a trip is selected, the screen turns into the navigation mode (Figure 39).

Alternatively, the service to be executed can be represented by a roadmap. In such a case the selection is performed by pressing the “Roadmap” button on TC-430™ main screen or by selecting “Menu → Service menu → Select roadmap”.

Roadmaps list is presented on screen (Figure 34).

As usual the roadmaps list can be sorted/filtered by code/description by pressing the “Code”/“Descr” buttons and by using the TC-430™ keyboard.



Figure 34: Roadmap selection

After selecting a roadmap, the driver is invited to select a trip to be driven among the ones composing the roadmap (Figure 33).

Finally another way for selecting the service to be executed is represented by the direct selection of a single trip. The procedure is started by pressing “Trip” button on TC-430™ main screen or by selecting “Menu → Service menu → Select trip”.

If the current data file being used by the system defines at least a calendar (see [1] or [3] for further details) then the list of active trips (that is trips linked to a calendar which is active at the time of the trip selection) is shown on screen (Figure 35).



Figure 35: Active trips selection

While reviewing the list of active trips it is possible to switch to full manual route/path/trip selection by pressing button “All”.

If no calendars have been defined within the current data file (or if “All” has been presented in the screen show in Figure 35) then trip is selected by navigating the objects hierarchy “Routes → Paths → Trip” (see [1] for further details), so the first element to be selected is the route the desired trip belongs to (Figure 36).



Figure 36: Route selection

The list of paths defined on the selected route is shown by pressing the “Next” button (Figure 37).



Figure 37: Path selection

At the end, the list of trips defined on the selected path is shown on screen by pressing again the “Next” button (Figure 33).

Alternatively during path selection it is also possible to hold the “Next” (thus triggering its second function “Drive”) to just drive the selected path without loading any particular trip. This function can be useful on test buses for double-checking the correct definition of a path, without the need to drive that path at any given specific time during the day (as it would happen driving a trip).

7.3.2 Navigation

Once a service is selected (see paragraph 7.3.1) the TC-430™ screen is turned into navigation mode (Figure 39).

During the navigation, the system autonomously command all the signs (external and/or internal) and all other on-board equipment depending on the service program defined in Verba 2014™ (see [1] for further details).

The screen presented while navigating basically reports the list of upcoming stops along the service to be executed (stops are listed bottom-up, being the next one represented at the bottom of the screen). By pressing “Details” further information about the service being executed can be accessed (Figure 38).

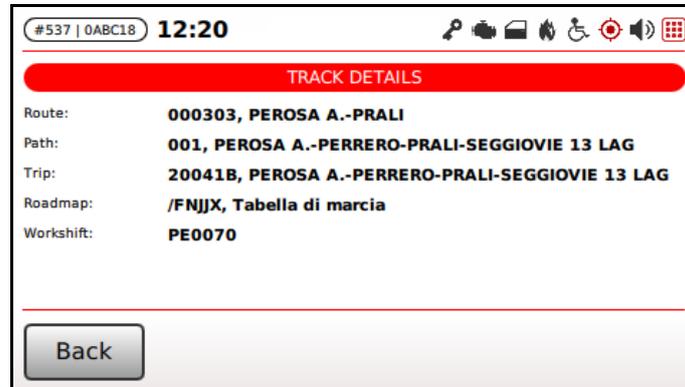


Figure 38: Service details

For every stop, its code, transit time (if available) and description is shown (if the description is longer than the available space on the screen, then it can be dragged leftward in order to reveal the hidden part).



Figure 39: Navigation screen

The current stop (that is, the stop nearby which the bus actually is or the next stop that the bus is approaching) appears highlighted. The code of the stop blinks if the bus is currently in the area of the stop.

In the upper part of the screen, the distance to the current stop is shown next to the symbol $\rightarrow*$, whereas the current destination (that is the destination to be published by external display as programmed on the path) is reported within the title bar.

The current stop is automatically updated by the system as the bus advances along the expected path. Anyway the path-recognition algorithm can be forced to expect a different current stop by simply selecting another stop in the list (using “Up” and “Down” arrows on the keypad or touching the code of a stop) and hitting the function “Align”. When a stop different from the current one has been selected by the user, then the visualization can be reverted back to the current stop simply pressing the button “Current” (Figure 40).



Figure 40: Reverting to current stop

If the selected service starts later on, the system a banner reporting “*Time waiting...*” is shown on screen. It simply means that it is too early for starting the requested service and so the system is simply waiting that the expected starting time of the service to be executed approaches (Figure 41). The time threshold for time waiting can be configured using Verba 2014™ (see [1] for further details).

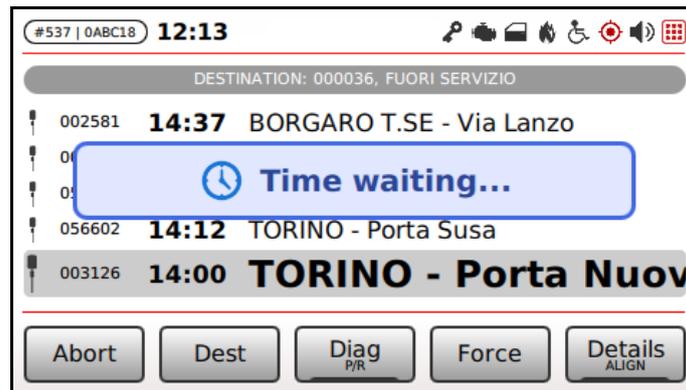


Figure 41: Time waiting at the beginning of the navigation

A service which is “time waiting” can be forced to be started pressing “*Force*” or “*Align*” (eventually on different stop).

If the current time is compatible with the expected service time but the bus is not at the location of the service start terminus, then a banner reporting “*Waiting terminus...*” is reported on the screen (Figure 42).

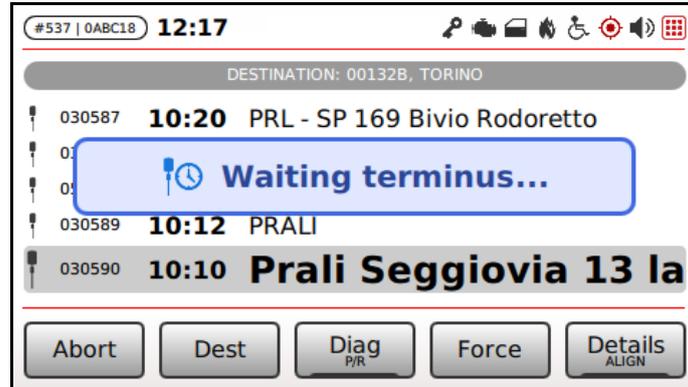


Figure 42: Waiting initial navigation terminus

In such a case, the service is commenced as soon as the bus reaches the location of the starting terminus. Anyway the service start can be forced by pressing “Force” or “Align” (eventually on a different stop).

When a stop is detected (that is the bus is within the area programmed for a stop) the visualization is turned into one of those depicted in Figure 43, depending on the service time profile (on schedule, on advance, on delay).

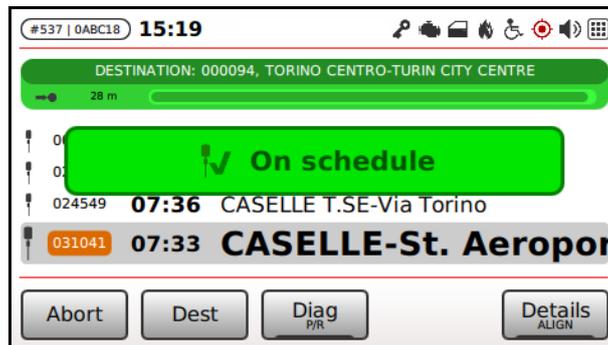


Figure 43: Stop detection

When the current trip is completed, the screen in Figure 44 is shown for some seconds: after that the subsequent trip in the current service (if any) is automatically commenced, otherwise the service is closed and the system returns to the main screen.

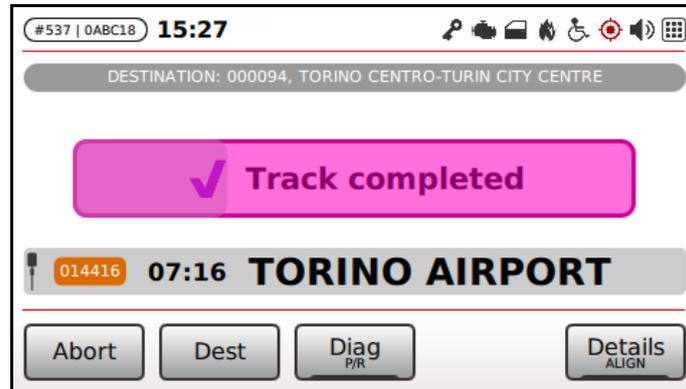


Figure 44: Trip completed screen

If, during the navigation, the path-recognition system is able to recognize the expected track no more, then a proper message is presented on screen (Figure 45).



Figure 45: Navigation lost.

The navigation resumes automatically as the system detects the expected track again. The system can be forced to “align” the path-recognition algorithm to a different stop/next-stop simply selecting the stop and issuing the “Align” function.

If allowed by configuration, the driver can be substituted without leaving the current service, pressing the button “Driver”.

The currently selected service can be abandoned at any time, pressing the button “Abort” (thus cancelling the execution of the selected service). A proper confirmation message is shown on screen before aborting the service (Figure 46).

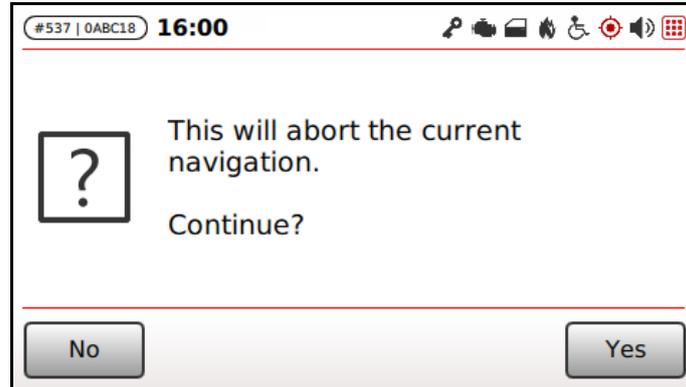


Figure 46: Service abortion

When navigation is started and multimedia files related to waypoints or stops along the specific track are missing, a warning message is displayed, communicating the number of missing files (Figure 47).

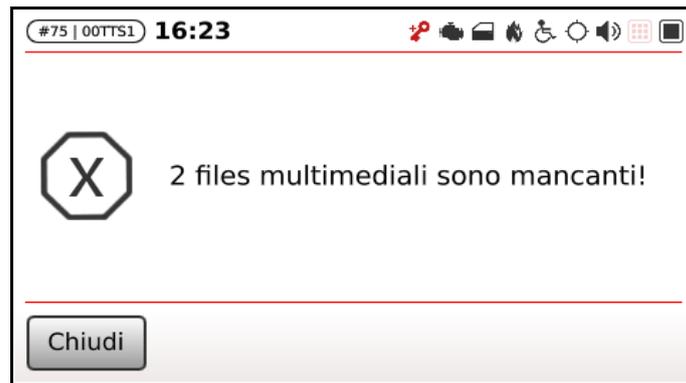


Figure 47: Multimedia files missing

It's also possible to get the detailed list of the missing multimedia files by holding the button labelled "Missing" (Figure 48).



Figure 48: Multimedia files missing (details)

7.3.3 Destination override

During a navigation the destination to be shown by the external displays is programmed together with the service definition (see [1] for further details) and it is automatically handled by the system (the current destination is shown in the upper part of the navigation screen (Figure 39).

However the driver can override the destination automatically handled by the system for forcing a different destination (e.g. if the final destination cannot be reached for some reasons). The destination can be overridden by simply pressing the button “Dest”. The list of available destinations is presented on screen for selection.

When the destination has been overridden somehow, the button “Dest” is turned red (Figure 49).



Figure 49: Trip destination override

Automatic destination management is resumed by issuing the “Auto” function.



Be aware!

The overridden destination also affects the subsequent trips belonging to the current workshift/roadmap.

7.3.4 P/R message during navigation

P/R messages can be manually selected by the driver during navigation by pressing the button “P/R”. The list of available P/R messages is presented on screen for selection.

When a P/R message is active, the button “P/R” is turned red (Figure 50).



Figure 50: P/R selection during navigation

P/R message can be deactivated pressing again the button “P/R” and then selecting the button “Clear”.

7.3.5 System diagnostics during navigation

For debugging and/or assistance purposes, the full system diagnostics menu can be accessed during navigation simply pressing the button “Diag”. The available diagnostics is the same described in paragraph 8.

7.4 Route/destination (media) mode

The *Route/Destination (media)* mode is exactly the same as the *Route/Destination* mode described in 7.2 except that media selection shortcut (see paragraph 7.1.6) is presented as soft key on the main screen instead of info message selection (see paragraph 7.2.5).

7.5 NextStop (media) mode

The *NextStop (media)* mode is exactly the same same as *NextStop* mode (described in 7.3) except that media selection shortcut (see paragraph 7.1.6) is presented as soft key on the main screen instead of info message selection (see paragraph 7.2.5).

8. Diagnostics

8.1 System info

Info about the system are available by selecting “Menu → Diagnostics menu → System info”. The screen in Figure 51 is shown.



Figure 51: System info

System info gathers info about:

- the device serial number (shown next to the screen title);
- the board, that is the electronic PCB the system is built-on;
- the operating system version being used by the device;
- the firmware version running on the low-level microcontroller hosted by the system;
- the application version;
- some application parameters (namely current name and/or MD5 of the system configuration, the GPS settings, the version of the dirty words definition and the current timezone).

Aesys® customer service can ask these info when providing assistance.

By clicking the “Storage” button it is also possible to show a screen summarizing the current usage of mass storages available on the system (Figure 52).

For every mass storage device the total size, the reserved size, the used space (both in bytes and as percentage) and the free space is reported. Mass storage labels are properly colored for pointing out the attention on units which are lacking free space.

While in storage view, tapping on “System” button reverts back to system info screen.

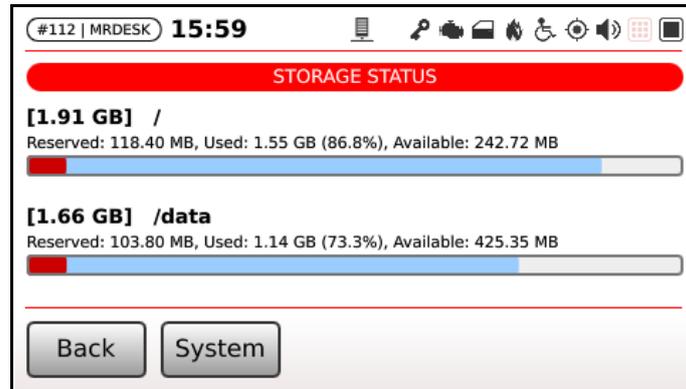


Figure 52: Mass storage usage

8.2 Hardware monitor

Hardware monitor is accessible by selecting “Menu → Diagnostics menu → Hardware monitor”. The screen in Figure 53 is shown.

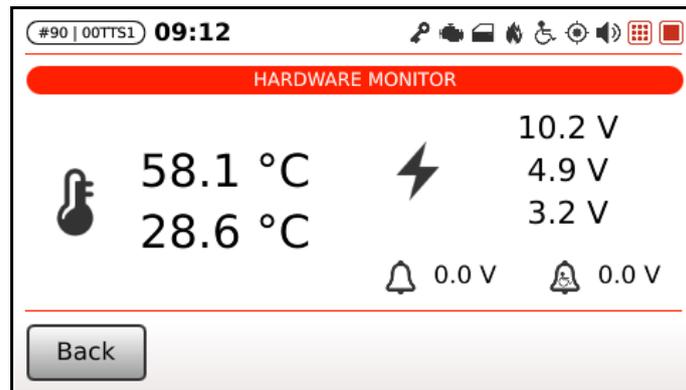


Figure 53: Hardware monitor

Hardware monitor shows:

- temperature sensors on the left (CPU temperature and case temperature respectively);
- power supply status on the right (respectively main power input, 5V and 3.3V);
- stop request analog signals voltage on bottom-right corner.

Temperatures and power supply values get properly colorized in order to notify warning (orange) or critical (red) conditions.

Stop request icons (standard and wheelchair request) turn red when the voltage is above 4.5V threshold (+/- 0.5V hysteresis). The threshold has been studied in order to conform to the majority of bus installations, but can anyway be configured to different values. Please contact Aesys® customer service if in need to change threshold and/or hysteresis figures.

8.3 Signs diagnostics

The diagnostic info about LED signs handled by the control unit is accessible by selecting “Menu → Diagnostics menu → Displays”. The screen in Figure 54 is shown.

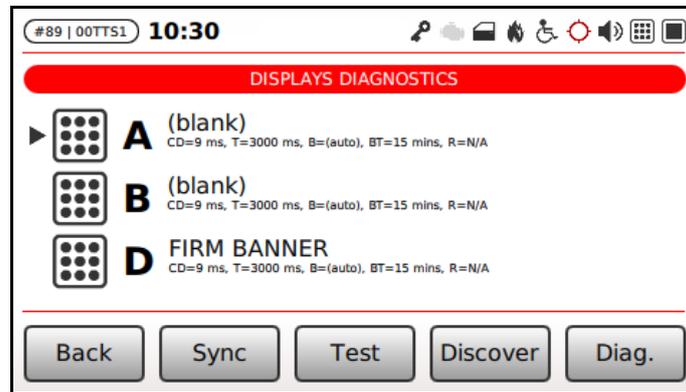


Figure 54: LED signs diagnostics

The list of signs managed by the control unit is shown on the screen. The logical address and some functional parameters of every sign is reported (being “CD” the inter-character delay, “T” the communication timeout, “B” the brightness, “BT” the blanking timeout and “R” the last display response timestamp).

Every sign entry also reports a description of the current publication being shown (“blank” stands for no active publication, “D” stands for current publication and “P/R” stands for current P/R message).

A cursor (▶) is shown next to the active sign (the active sign is the device the control unit is currently communicating with).

If some trouble occurred while communicating with a sign, then the correspondent entry in the list is shown in red. In case of troubles the LED signs icon in the status bar also gets flashing red.

A warning icon ⚠ is overlapped to icon of the signs for which the resource corresponding to the current publication is not available (Figure 55). The problem can be fixed by simply implementing in Aesys® Verba 2014™ [1] the resources corresponding to the current sign publication.

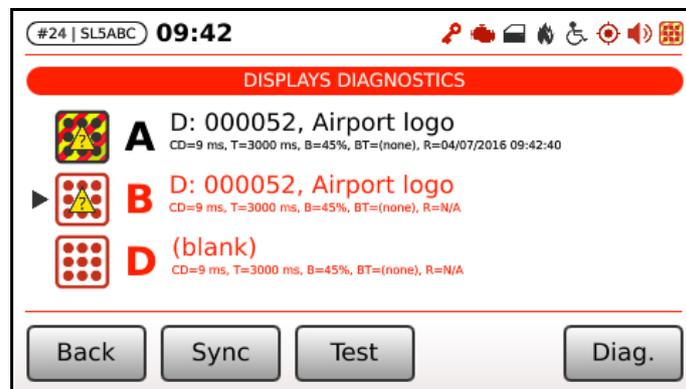


Figure 55: LED signs diagnostics: missing resources

If a sign is in power saving mode (see paragraph 9.4.3) then the corresponding icon is shown “slashed” and the text “BLANK” (uppercase) is shown at the beginning of the sign description. While in power saving mode the sign is kept blank. If at least one sign is in power saving mode, then the LED signs icon in the status bar also gets “slashed”.

The the icon corresponding to a sign is pale gray then the signs has been disabled (see paragraph 9.4.4).

If a sign reports self-diagnostic problem (e.g. broken LEDs) then a blinking red/yellow background is shown on the corresponding icon in the signs list. The threshold for determining if the count of broken LEDs reported by the sign really represents an issue (and so the alarm is reported) is configured as described in paragraph 9.4.5.

Signs are periodically polled by the control unit, in order to recover the proper publication in case of sudden sign restart. Anyway it is possible to force the system to immediately refresh the publication of signs by simply pressing “Sync”.

Soft key “Test” toggles the signs test mode. While in test mode, signs are commanded to publish an automatic test (the actual publication depends on the firmware installed in the sign, but usually comprehends the version of the sign firmware and the logical address of the sign). Button “Test” turns red when the test mode is active. Test mode, if active, is automatically terminated while leaving the LED signs diagnostics screen.

The button “Discover” toggles the signs discovery mode. While in discovery mode LED the control unit tells to all connected signs (broadcast), even the ones not listed, to enter the test mode. Button “Discovery” turns red when the discovery mode is active. Discovery mode is particularly useful on buses where the address of installed LED signs is unknown or does not match the expectations. In discovery mode all signs show their address (and other useful information) to let the maintenance personnel to recognize and properly configure them. When discovery mode is active (red button) the publication description shown for every listed sign is relevant no more. Discovery mode, if active, is automatically terminated while leaving the LED signs diagnostics screen.

The button labelled “Diag.” toggles the visualization of signs self-diagnostic data (if available depending on the sign model), as shown in Figure 56.

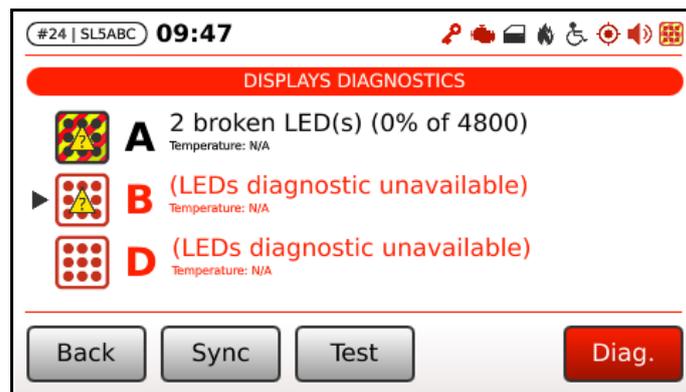


Figure 56: LED signs self-diagnostic report

For every sign supporting self-diagnostic, the count of broken LEDs (absolute and percentage), the count of total sign LEDs and/or the version of the firmware running on the sign is reported.

8.4 Audio devices diagnostics

The diagnostic of vocal announcement equipments handled by the control unit is accessible by selecting “Menu → Diagnostics menu → Audio devices”. The screen in Figure 57 is shown.



Figure 57: Vocal announcement equipments diagnostics

The list of vocal announcement equipments managed by the control unit is shown on the screen. The logical address and some functional parameters of every device is reported (being “*CD*” the inter-character delay, “*T*” the communication timeout, “*R*” the last display response timestamp, “*RPT*” the counter of current message repetition and the delay between repetitions, “*V*” the current volume, “*VMIN*”/“*VMAX*” the minimum and the maximum volume configured on the device, “*I*” the announcement delay (only applies for external announcements), “*M*” the automatic muting time and “*U*” the automatic un-muting time). TTS vocal announcement equipments are labelled “*TTS*” or “*BUILT-IN TTS*” depending on the fact that the system is relying on an external device (namely an Aesys® DevonPro™ device) or to the internal TTS engine (if available).

Every device also reports a description of the current message being announced (“*no speech*” stands for no messages being announced and “*D*” stands for current destination).

A cursor (▶) is shown next to the active device (the active device is the device the control unit is currently communicating with).

If some trouble occurred while communicating with a device, then the device is shown in red. In case of troubles the vocal announcements icon in the status bar also gets flashing red.

If an audio device has been muted (see paragraphs 9.5.2) then the corresponding icon is shown “slashed”. If at least an audio device is muted, then the vocal announcement equipments icon in the status bar also gets “slashed”.

Vocal announcement equipments are periodically polled by the control unit, in order to recover the proper announcement in case of sudden vocal device restart. Anyway it is possible to force the system to immediately refresh the announcement of the device by simply pressing “*Sync*”.

Soft key “*Test*” toggles the vocal announcement equipments test mode. While in test mode vocal devices are commanded to enter an automatic test (the actual test depends on the firmware installed in the vocal device itself, but usually consists in emitting a “beep” through all the audio output ports managed by the system). Test mode, if active, is automatically terminated while leaving the vocal announcement equipments diagnostics screen or as soon as all the devices have complete the automatic test.

8.5 Text-to-speech (TTS) diagnostics

The status/diagnostics of the text-to-speech (TTS) subsystem can be accessed by selecting “*Menu → Diagnostics menu → Text-to-speech*”. The screen in Figure 58 is shown.

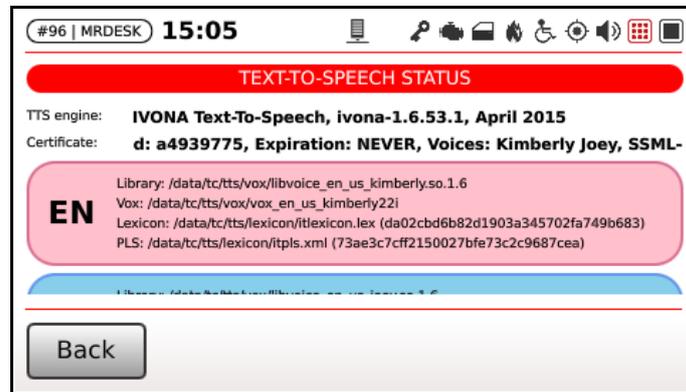


Figure 58: Text-to-speech diagnostics

In the upper part of the screen the info about the TTS engine being used and the corresponding certificate are reported (namely the unique certificate ID, the certification expiration, the list of voices enabled by the certificate being used and the SSML extensions enable flag reported in the certificate).

The remaining part of the screen lists the voices currently available for the TTS engine (that is: voices that are enabled by the TTS certificate file and that have been properly configured within the TC-430™ configuration). For every voice, the paths to the LIB, VOX, lexicon and PLS file are reported, together with the MD5 digest of lexicon and PLS files). The box corresponding to every voice also reports the language the voice is intended for and the box is pink colored for female voices and azure colored for male ones.



Notice

TTS configuration may be complex and its description goes far beyond the aim this user guide; please refer to Aesys® Customer Service for further info about that, if requested.

8.6 Screens diagnostics

The diagnostic info about LCD screens handled by the control unit is accessible by selecting “*Menu → Diagnostics menu → Screens*”. The screen in Figure 59 is shown.

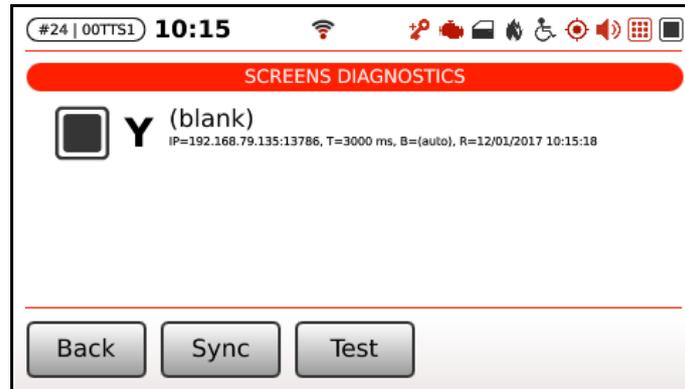


Figure 59: Screens diagnostics

The list of screens managed by the control unit is shown on the screen. The IP address/TCP port and some functional parameters of every sign are reported (being “T” the communication timeout, “B” the brightness, and “R” the last display response timestamp).

Every screen entry also reports a description of the current publication being shown (“blank” stands for no active publication, otherwise the list of media files being reproduced by the screen are reported).

A cursor (▶) is shown next to the active screen (the active screen is the device the control unit is currently communicating with).

If some trouble occurred while communicating with a screen, then the correspondent entry in the list is shown in red. In case of troubles the screens icon in the status bar also gets flashing red.

The the icon corresponding to a sign is pale gray then the screen has been disabled.

Screens are periodically polled by the control unit, in order to recover the proper publication in case of sudden screen restart. Anyway it is possible to force the system to immediately refresh the publication of screen by simply pressing “Sync”.

Soft key “Test” toggles the screens test mode. While in test mode, screens are commanded to publish a default page (usually reporting the IP address of the screen itself and eventually other info; the actual page being published depends on the configuration of the screen). Test mode, if active, is automatically terminated while leaving the screens diagnostics page.

It is also possible to get detailed information about a screen (if supported by the device) by clicking on the correspondent line (Figure 60).

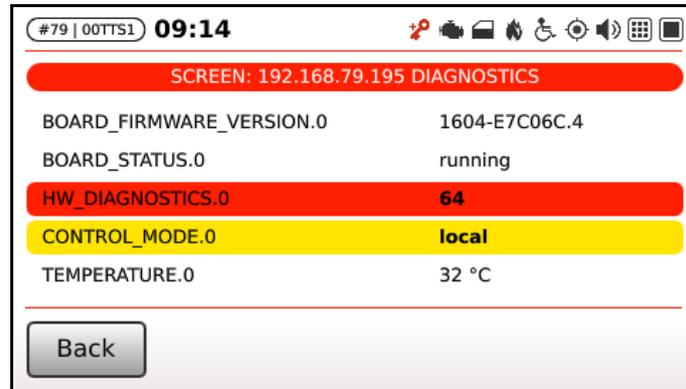


Figure 60: Screen diagnostic details

8.7 GPS status

The GPS status is accessible by selecting “Menu → Diagnostics menu → GPS status”. The screen in Figure 61 is shown.



Figure 61: GPS status

GPS status reports:

- the number of satellites in sight;
- the dilution of precision (DOP) of the current GPS fix (composed, horizontal and vertical);
- the current GPS clock (expressed as UTC time);
- the current GPS fix, if any (in terms of latitude, longitude, altitude and heading);
- the current speed detected by GPS.

The GPS icon in the status bar is  if a valid GPS fix is available, otherwise it is shown as .

Please be aware that the heading is updated only if the speed is not null (that is, only if the bus is moving).

If the system is configured for setting the clock by the GPS (see paragraph 9.2.2) then the UTC time received from the GPS system is used for setting the current date/time (depending on the configured timezone).

Soft keys “*Decimal*” and “*Degrees*” respectively toggles between the decimal and sexagesimal notation for GPS latitude and longitude.

8.8 Networking status

The networking diagnostics screen is accessible by selecting “*Menu* → *Diagnostics menu* → *Networking*”. The screen in Figure 62 is shown.

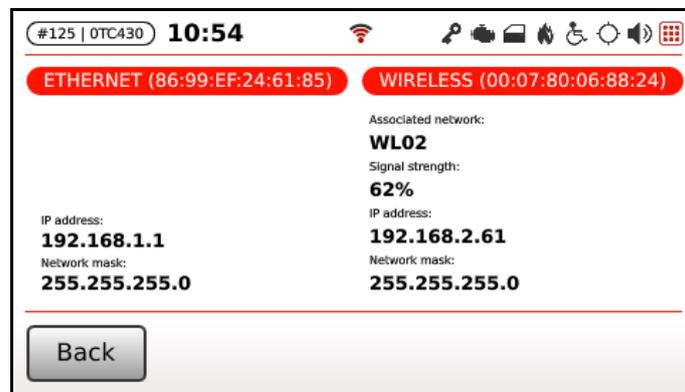


Figure 62: Networking status

Networking status reports info about both the wired connection (Ethernet) and the wireless connection (if available).

The MAC address of the network adapters is reported next to the section titles.

For both network interfaces the current IP address and the current subnet mask is reported (if available, otherwise a dash “-” is shown instead).

If the wireless adapter is under coverage of the home network (see paragraphs 9.8.4 and 9.8.5) then also the name of the network and the signal strength is reported.

If the wireless adapter is connected to the home network also an icon  is shown in the status bar (the icon gets properly colorized in order to report the quality of the network signal).

8.9 Server connection

The diagnostic about the status of the connection toward Aesys® Verba 2014™ and/or toward Aesys® HAL™ is accessed by selecting “*Menu* → *Diagnostics menu* → *Server connection*”. The screen in Figure 63 is shown.

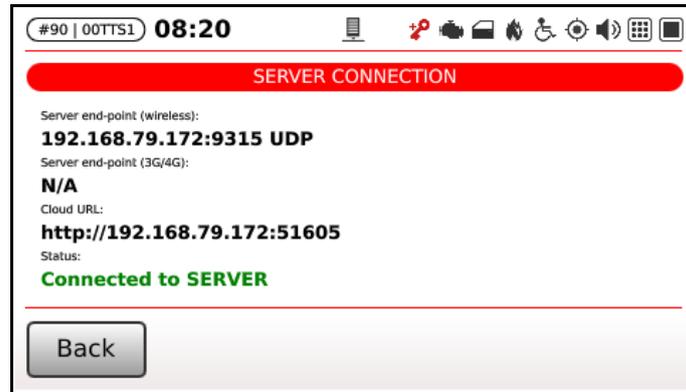


Figure 63: Server connection status

Figure 63 reports the IP address and the UDP port the TC-430™ is trying to contact Verba 2014™ at on both wireless and 2G/3G interface, via external router (IP address and UDP ports are configured in Verba 2014™ and transferred to TC-430™ within the VDB file exported by Verba 2014™ and cannot be locally configured/modified at TC-430™).

Also Figure 63 reports the URL the TC-430™ is trying to contact Aesys® cloud (HAL™) at.

A label reports whether the TC-430™ is currently connected to the server and or to the cloud or not.



Notice

From a purely technical point of view, TC-430™, depending on its configuration, can be simultaneously connected to both Verba 2014™ and HAL™, but however this scenario is not practically useful and could lead to unpredictable circumstances.

If the control unit is connected to the cloud then also the name of the cloud customer the device is paired with (if known) is reported in the presented screen.

If TC-430™ is connected to Verba 2014™ and/or to HAL™ then also an icon  is shown in the system status bar.

When dealing with HAL™, the icon shown in the system status bar can change accordingly with the connection status, as summarized in Table 3.

Icon	Description
	No connection: TC-430™ cannot reach the Internet; please double-check the URL configured for the cloud connection, the control unit network interface configuration and/or the external router configuration.
	TC-430™ reaches the Internet but fails in passing HAL™ authentication; problems are likely to be cloud-side: please contact Aesys® support for further assistance.
	TC-430™ is connected to HAL™ but the control unit serial number and/or the bus code does not match what configured on the cloud; the cloud pairing procedure has to be performed and/or repeated to fix the problems.
	Successfully connected to HAL™.

Table 3: HAL™ connection icon

8.10 CMS (multimedia contents)

“Menu → Diagnostics menu → CMS” (Figure 64) reports the current status of the control unit module devoted to synchronizing with Aesys® CMS for multimedia contents (configured as described in paragraph 9.8.7).

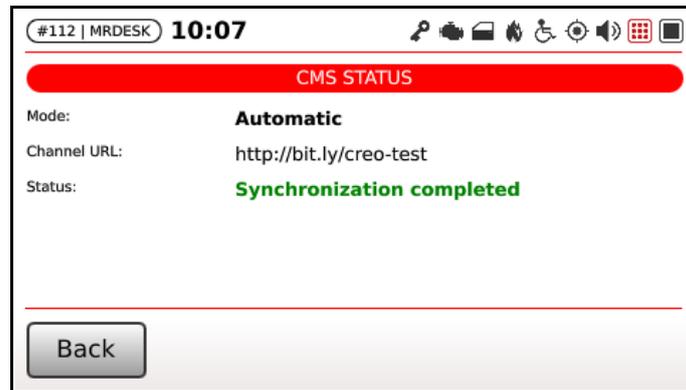


Figure 64: CMS diagnostics

The CMS mode and the URL of the CMS channel currently being synchronized on the control unit is reported.

The screen also reports the current status of the CMS synchronization and even the error messages, if some of them occurred.

8.11 Distance counters

The screen at “Menu → Diagnostics → Distance counters” (Figure 65) report the status of the odometric counters currently handled by the control unit.

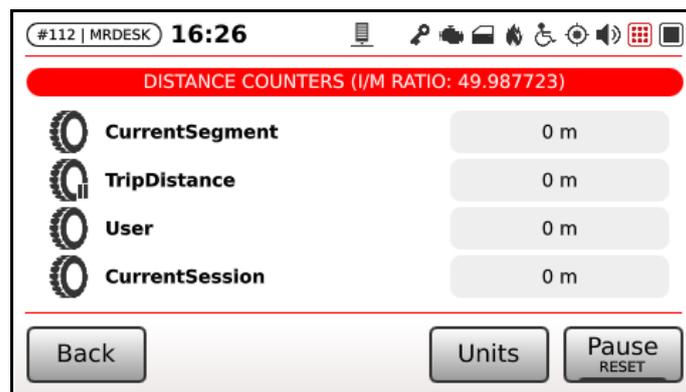


Figure 65: Distance counters

Depending on the status of the control unit (navigation active or not) some of the counters can be paused (as reported by the corresponding icon) or even may get reset.

The counter named “*User*” is for operator use, and can be respectively paused and reset by pressing or holding the last soft button on the screen.

Button “*Units*” toggles the reported between metric (meters/kilometers) and American units (yards/miles).

The title of the screen also reports the current conversion ratio (“*I/M ratio*”) between the bus odometer impulses and the corresponding distance driven by the bus (the conversion is continuously updated by the system as long as the bus travels at a relevant speed and the GPS fix is available).

9. System configuration

TC-430™ configuration is accessed by entering the “*Setup*” menu (secondary function of the rightmost soft key on system main screen).

Please consider that a part of system configuration can come with the current data file being used by the system. In such case it is possible to locally override the settings defined in data file to match user needs.

The access to the system configuration menu is protected by password, being the default password “**12345**” (Figure 66).

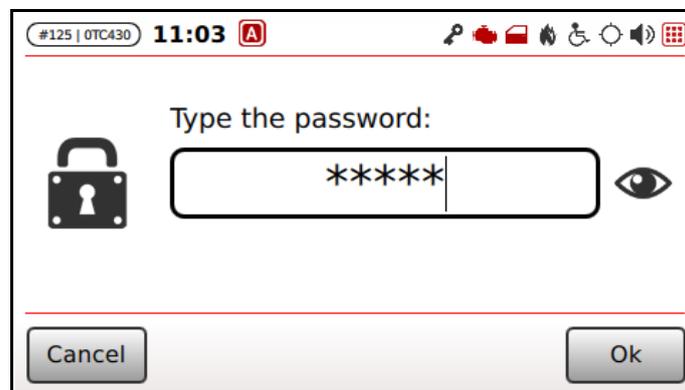


Figure 66: Password request for entering the system configuration and administration menu

! Be aware!

The character being typed is shown for a while on the screen during password entering: look back before typing, for avoiding to reveal the system password to anyone is behind you.

Pressing (and holding) the touch-screen in correspondence of the “eye” icon  reveals the typed text, in order to let double-check the typed password.

! Be aware!

Look back before pressing the “eye” icon, otherwise the system password will be revealed to anyone standing behind you looking at the screen.

9.1 Change password

The password for accessing the system configuration menu can be changed, by selecting “*Setup* → *Change password*”.

The new password has to be typed twice for confirmation.

9.2 Date/time setup

9.2.1 Timezone selection

The current timezone can be configured in order to reflect the current service location of the bus. By default it is set to “*Automatic timezone (from file)*” for using the timezone specified in the data file being used by the system (please refer to [1] for directions about how it is possible to configure the timezone using Aesys® Verba 2014™).

The timezone is used for conversion to and from the UTC time (e.g. when the system clock has to be updated from GPS).

9.2.2 GPS clock update

The “*GPS clock update*” option configures the clock update strategy to be used by the control unit (Figure 67).

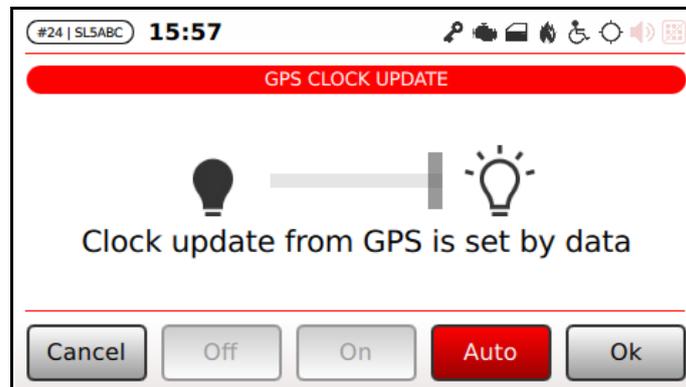


Figure 67: GPS clock update option

Soft key “*Auto*” toggles between automatic mode and manual mode (the automatic mode is active when the soft key is red).

In automatic mode, the clock update strategy is defined by the data file currently being used by the system (any other option is disabled in the screen shown in Figure 67). Please refer to [1] for further directions about how to configure GPS clock update strategy in Aesys® Verba 2014™.

If the automatic mode is not enabled, then tapping the switch shown on the screen (or pressing “*Off*” and “*On*” soft keys) it is possible to respectively disable or enable the automatic clock setting driven by GPS.

If clock setting by the GPS is enabled, then every time the UTC clock is received by the GPS system then it is compared to the system time: if a relevant difference is detected then the system clock is updated accordingly to the UTC clock (considering the current timezone).

9.3 Manual clock setting

If the automatic update of system clock by GPS is not enabled, then the clock can be manually set by selecting “*Setup* → *Date/time setup* → *Set clock*”. The screen in Figure 68 is shown.

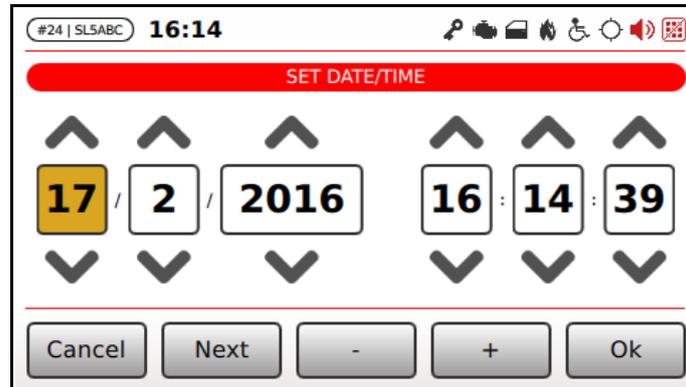


Figure 68: Manual clock setup

The system clock can be adjusted by tapping \wedge and \vee next to date/time parts (system clock is presented in “day/month/year hours:minutes:seconds” format). Alternatively it is possible to select the part to be modified by pressing “Next” and then use soft keys labeled “-” or “+” for respectively decrementing or incrementing the selected part (highlighted in yellow).

The new clock configuration is confirmed pressing “Ok”.

9.4 Displays setup

9.4.1 Local override

The configuration of LED signs properties is usually defined by the data file being used by the system. In order to perform local modifications to the configuration defined by the data file, the local override switch must be enabled by accessing “Setup → Displays setup → Local override” (Figure 69).

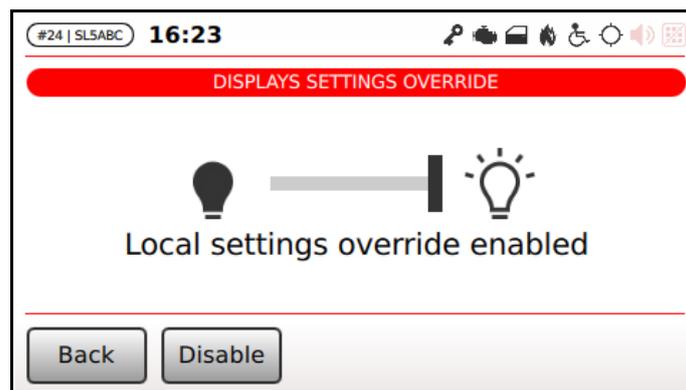


Figure 69: Displays setup local override

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.4.2 Signs brightness

If signs local settings override is enabled (paragraph 9.4.1) then the brightness of LED signs can be configured by accessing “Setup → Displays setup → Brightness” (Figure 70).

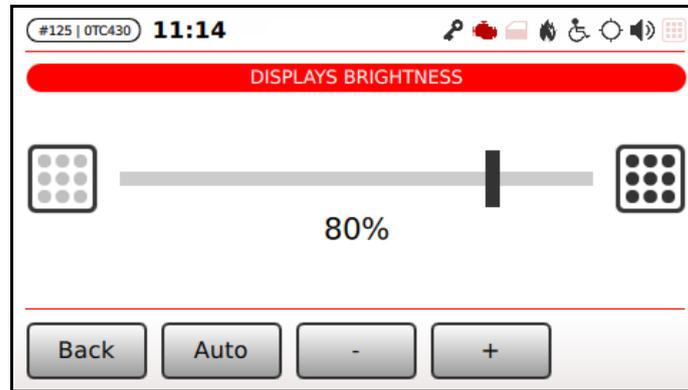


Figure 70: LED signs brightness configuration

Soft key labeled “Auto” toggles between automatic and manual mode.

In automatic mode signs automatically adjust their brightness depending on the detected environmental light.

In manual mode the brightness percentage of all signs is configured by the slider shown in Figure 70 (soft keys “-” and “+” can be used in order for respectively decreasing or increasing the brightness of signs).

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.4.3 Signs power savings

If signs local settings override is enabled (paragraph 9.4.1) then the power saving delay of LED signs can be configured by accessing “Setup → Displays setup → Power saving” (Figure 71).

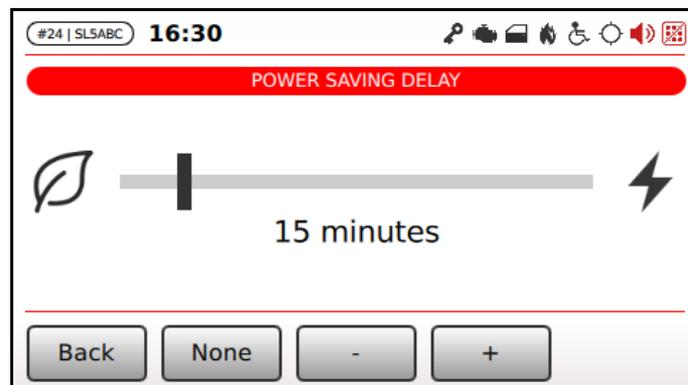


Figure 71: LED signs power saving

While a sign enters the power saving mode, then its publication is blanked (to save energy). Signs enter the power saving mode when a configurable amount of time has elapsed since bus engine switch-off (please

refer to the installation manual of TC-430™ in order to have further info about cablings related to the bus engine status input signal, and refer to paragraph 9.6 for details about engine signal configuration).

Soft key labeled “None” enables/disables the power saving mode at all.

If power saving is enabled, then the interval of time (starting from bus engine switch-off) after which displays enter the power saving mode can be configured dragging the slider shown in Figure 71 (or by pressing “-” and “+” soft keys for respectively decreasing and increasing the interval of time).

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.4.4 Internal signs enabling

If signs local settings override is enabled (paragraph 9.4.1) then internal LED signs can be explicitly enabled or disabled by accessing “Setup → Displays setup → Internal signs enabling” (Figure 72).

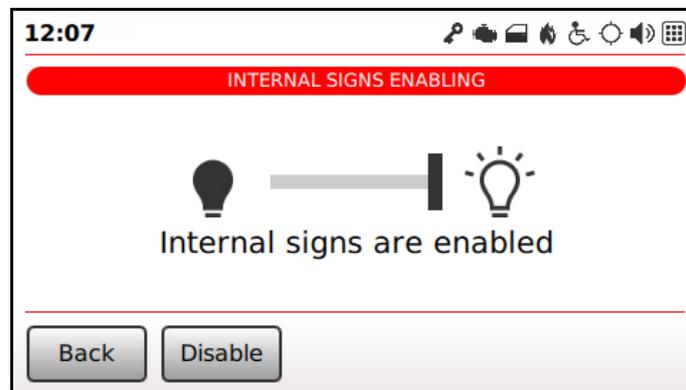


Figure 72: Internal signs enabling

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

If a sign is disabled then it is not managed at all by the system: disabling internal signs may be useful when loading to the TC-430 an old-style TRX file, which always assumes that an internal displays named “D” is installed on the system. If it is not the case then internal signs management can be safely disabled in order to get rid of warning messages about the missing display.

9.4.5 Dash sign

Dash sign can be enabled or disabled depending on its real availability within the bus equipment. Dash sign can be toggled accessing “Setup → Displays setup → Toggle dash sign” (Figure 73).

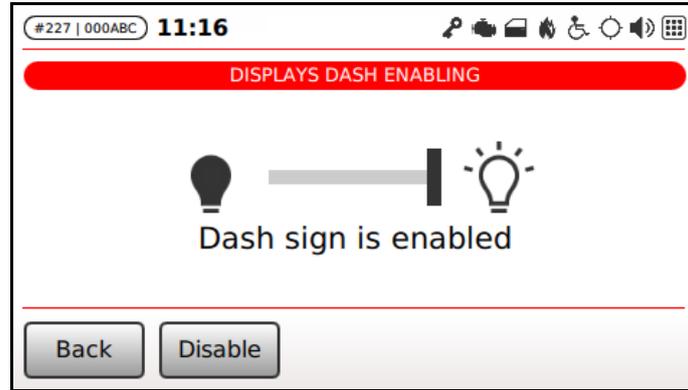


Figure 73: Toggling dash sign

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.4.6 Last publications

If signs local settings override is enabled (paragraph 9.4.1) then TC-430™ can be configured for automatically reloading the last used destination, P/R message or info message upon reboot. Such configurations are accessible (respectively) at “Setup → Displays setup → Last publications handling → Last destination”, “Setup → Displays setup → Last publications handling → Last P/R message”, “Setup → Displays setup → Last publications handling → Last info message” (Figure 74).



Figure 74: Last publication flags

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.4.7 Diagnostics

Displays self-diagnostic can be toggled (enabled or disabled) depending on real capabilities of displays available on-board the bus.

This feature is useful because on legacy Aesys® LED signs not supporting self-diagnostics protocol, sending such commands may cause signs visualization troubles.

Displays self-diagnostic can be toggled accessing “Setup → Displays setup → Diagnostics” (Figure 75).

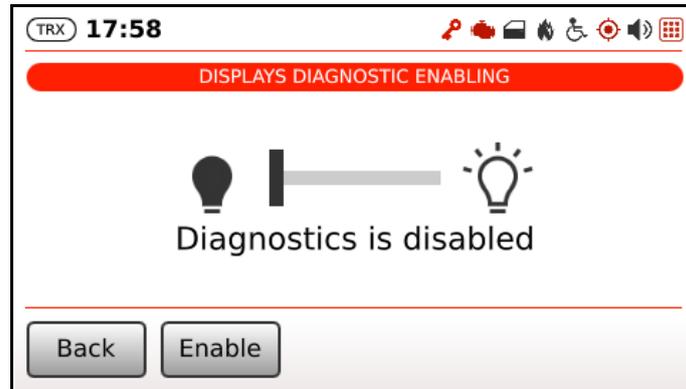


Figure 75: Toggling displays diagnostic

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.4.8 Broken LEDs threshold

If signs being driven by TC-430™ support self-diagnostic and displays self-diagnostic is enabled (see paragraph 9.4.5) then the count of broken LEDs can be reported into the signs self-diagnostic status (see paragraph 8.3).

A percentage threshold can be configured for issuing an alarm (message to the driver and red/yellow-backgrounded sign icon in status bar) if the count of broken LEDs goes beyond the desired limit. The threshold can be configured by accessing “Setup → Displays setup → Broken LEDs threshold” (Figure 76).

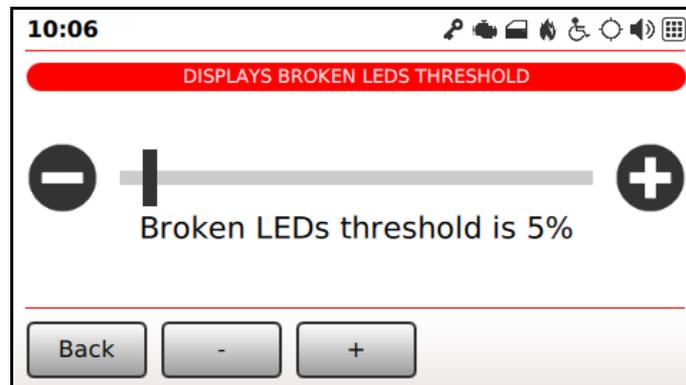


Figure 76: Signs broken LEDs threshold configuration

The percentage threshold of broken LEDs can be configured dragging the slider shown in Figure 76 (or by pressing “-” and “+” soft keys for respectively decreasing and increasing the threshold).

By default the threshold is set at 5%.

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.4.9 Displays maintenance

It is possible to make use of TC-430™ control unit for updating the firmware, configuration or fonts of connected LED signs, such a functionality being available at “Setup → Displays setup → Displays maintenance”.

TC-430™ normally exchanges data with LED signs over a serial line at 9600 bps. Usually during firmware/configuration/fonts update procedure such a speed is increased in order to shorten up the duration of the whole task. The serial speed used during maintenance tasks can be set at “Setup → Displays setup → Displays maintenance → Maintenance baud rate”, as shown in Figure 77.

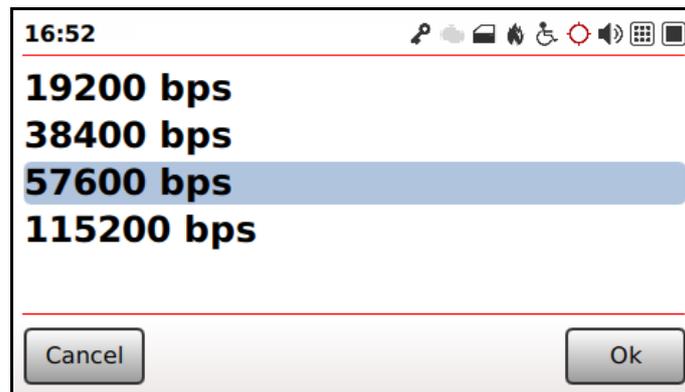


Figure 77: LED signs maintenance baud rate selection

The default is 57600 bps, but slower speeds can be attempted if the signs update procedure repeatedly fails.

UPDATE FROM FILE

LED signs can be updated by manually selecting an update file. The activity is started at “Setup → Displays setup → Displays maintenance → Update from file”. A list of available signs is shown on the screen and it is possible to select one of them and then hit “FW”, “Cfg”, “Fonts” buttons for respectively updating sign firmware, configuration or fonts (see Figure 78).



Figure 78: Sign selection for manual firmware/configuration/fonts update

The system then shows the content of the USB key for selecting the file representing the firmware, configuration or fonts definition to be updated (depending on the selected function) on the selected sign.

A progress bar is shown on screen during the update process. Proper messages are shown at the end of the process for reporting success or error messages.

UPDATE FROM FOLDER

For easing the update of several buses, it is possible to prepare a folder on the USB key for programming a set of sign updates to be performed in a row.

By selecting “Setup → Displays setup → Displays maintenance → Update from folder” the system let the user to select a folder from the USB key and then looks for files named <ADDRESS>.<EXT> in the given folder, where <ADDRESS> is a letter telling the target device for that update file and the extension <EXT> can be one of entries in the following table:

EXT	Description
DPR	Z80-based (SLIM2) sign firmware update
FLASH	NIOS-based (SLIM5) sign firmware update
FLB	NIOS-based (SLIM5) sign firmware update (binary file format)
DCC	Sign configuration update
FNE	Sign fonts update
FNB	Sign fonts update (binary format)

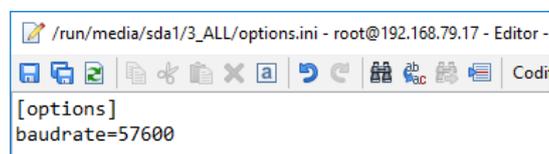
Table 4: Recognized filename extension for LED signs maintenance



Good to know

FLB and FNB files can be obtained out of (respectively) FLASH and FNE file using proper utility programs which can be provided by Aesys®. Please contact your sales representative if requested to do so.

The folder can also optionally contain a file named “options.ini” used for specifying the baud-rate to be used during the activities (if “options.ini” is not available or not valid the communication speed is defaulted to that specified in “Setup → Displays setup → Displays maintenance → Maintenance baud rate”).



```

/run/media/sda1/3_ALL/options.ini - root@192.168.79.17 - Editor -
[options]
baudrate=57600
    
```

Figure 79: “options.ini” example

TC-430™ automatically tries to perform all the update tasks specified by the files available in the selected folder and then shows an update report at the end of the entire process.

For backward compatibility with former Aesys® DC-600™ control units, the files in the selected folder can also be specified with the following naming schema: <AA><LBL>.DIS, where <AA> is the address of the target sign specified as two digits (being “01” = “A”, “02” = “B” and so on), and <LBL> is a label specifying the kind of the file to be uploaded. Allowed <LBL> entries are summarized in the following table:

LBL	Description
DPR	Z80-based (SLIM2) sign firmware update
FLA	NIOS-based (SLIM5) sign firmware update
FLB	NIOS-based (SLIM5) sign firmware update (binary file format)
DCC	Sign configuration update
FNE	Sign fonts update
FNB	Sign fonts update (binary format)

Table 5: Recognized labels for LED signs maintenance

For backward compatibility also with former Aesys® KC-640™ control units, also the following file name schema is recognized: <AA><XXX>.<EXT>, where <AA> is the address of the target sign specified as two digits (being “01” = “A”, “02” = “B” and so on), <XXX> are three not-relevant characters (can be anything) and <EXT> matches the extension already listed in Table 4.



Good to know

All extensions and labels are matched case-insensitively by TC-430™.



Note

TC-430™ automatically repeats some attempts if some errors were detected in the update process.

9.5 Audio setup

9.5.1 Local override

The configuration of vocal announcement equipments properties is usually defined by the data file being used by the system. In order to perform local modifications to the configuration defined by the data file, the local override switch must be enabled by accessing “Setup → Audio setup → Local override”.

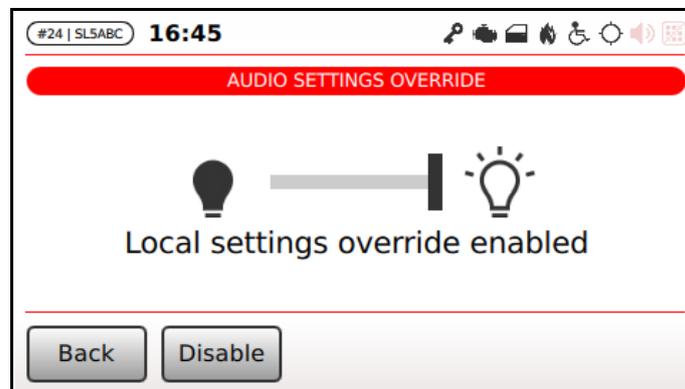


Figure 80: Vocal announcements equipment local override

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.5.2 Muting

Vocal announcement equipments can be muted/un-muted by accessing “Setup → Audio setup → Toggle mute” (Figure 81).

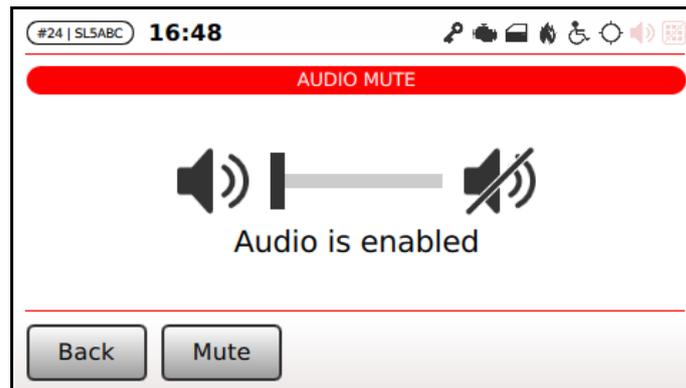


Figure 81: Vocal announcement equipments muting

TC-430™ can also be configured in order to automatically mute vocal announcement equipments depending on current time. The feature is useful for avoiding to disturb citizenship at night (muting the buses external announcements performed at bus stops).

Automatic mute configuration is accessed selecting “Setup → Audio setup → Set auto mute timings” (Figure 82).

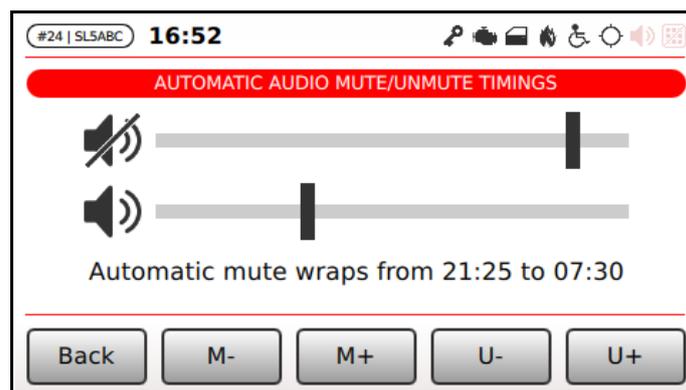


Figure 82: Vocal announcement equipments auto muting configuration

The two sliders shown in Figure 82 configure respectively the muting and the un-muting hours.

The automatic muting is disabled by simply setting the muting and un-muting hours at the same value (typically both at midnight).

Muting and un-muting hours can be configured moving the sliders in Figure 82 or by clicking “M-”, “M+”, “U-” and “U+” for respectively decrease or increase the muting hours and decrease or increase the un-muting hours.

If muting hours is greater than un-muting hours then the muting interval “wraps” and goes from muting hours to midnight and from midnight to un-muting hours. On the contrary the muting interval has to be intended straightforward (from muting hours to un-muting hours).

Global muting takes precedence over automatic muting. So if vocal announcement equipments have been muted through “Setup → Audio setup → Toggle mute”, then automatic muting is not relevant and vocal announcement equipments will be muted (independently from the current time).

Changes to muting and automatic muting configuration are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menus.

9.5.3 Volume settings

The announcement volume can be adjusted by entering “Setup → Audio setup → Set volume” (Figure 83).



Figure 83: Volume settings

“Auto” toggles between the automatic volume adjustment (performed by vocal announcement devices based on the environmental noise level) and the manual volume setting.

If manual volume configuration is selected, then the volume percentage of vocal announcement equipments can be adjusted by moving the slider shown in Figure 83 or just by pressing “-” and “+” for respectively decreasing and increasing the volume level.

If automatic mode is enabled, then the available volume range for automatic adjustment is configurable by accessing “Setup → Audio setup → Set automatic volume range” (Figure 84)

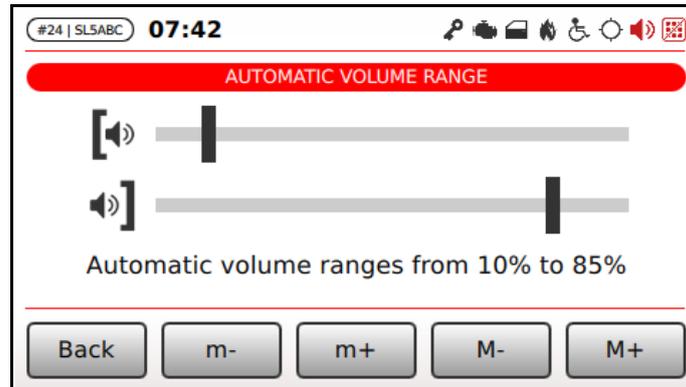


Figure 84: Automatic volume range configuration

The first slider shown in Figure 84 refers to the configuration of minimum volume, while the second slider refers to the configuration of the maximum volume (being the latter always greater or equal than the former).

Sliders can be moved by dragging them on the touch-screen, or also by pressing “m-”, “m+”, “M-” and “M+” for respectively decreasing and increasing the minimum volume or decreasing and increasing the maximum volume.

Changes in volume and automatic volume configuration are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menus.

9.5.4 External announcements delay

It is generally useful to configure the external vocal announcement equipments to obey an initial delay before starting an announcement, because announcements are normally performed when bus doors are being opened and it is not desirable that the speech is overlapped by the noise of opening doors.

The configuration of such a behavior is accessible by selecting “Setup → Audio setup → External announcements delay” (Figure 85).

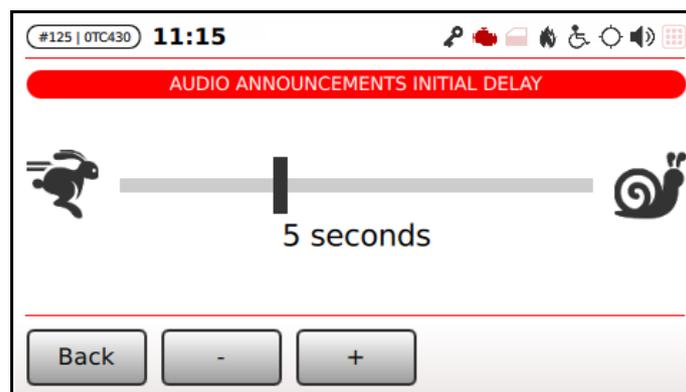


Figure 85: External announcements delay configuration

The delay to be obeyed by vocal announcement equipments can be configured by dragging the slider in Figure 85 on the touch-screen or by pressing “-” or “+” for respectively decreasing or increasing the delay amount.

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menu.

9.5.5 Announcements repetitions

TC-430™ vocal announcements can be repeated several times (for letting the destination of the bus to be announced several times if the bus remains at the stop keeping doors open).

The number of vocal announcement repetitions can be configured accessing “Setup → Audio setup → Announcements repetitions” (Figure 86).

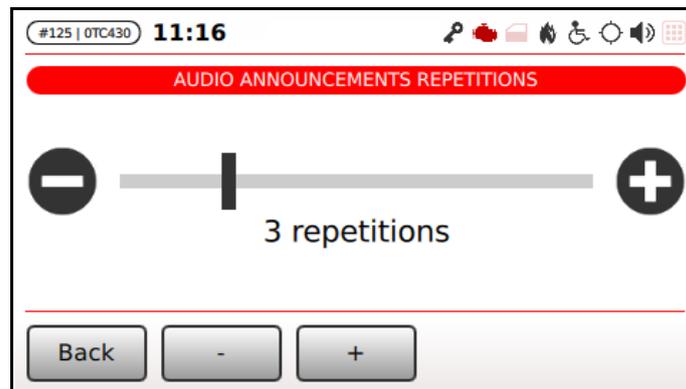


Figure 86: Vocal announcements repetitions

The number of repetitions can be adjusted by dragging the slider in Figure 86 on the touch screen, or by pressing “-” and “+” for respectively decreasing or increasing the repetitions count.

The time interval to be obeyed by the system between subsequent announcements can be configured by accessing “Setup → Audio setup → Repetitions interval” (Figure 87).



Figure 87: Vocal announcements repetitions interval

The interval to be obeyed between announcements can be adjusted by dragging the slider in Figure 86 on the touch screen, or by pressing “-” and “+” for respectively decreasing or increasing the interval.

The interval can be adjusted in 5 second steps.

Changes in repetitions count or interval are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menus.

9.6 Screens setup

9.6.1 Local override

The configuration of screen properties is usually defined by the data file being used by the system. In order to perform local modifications to the configuration defined by the data file, the local override switch must be enabled by accessing “Setup → Screens setup → Local override” (Figure 80).

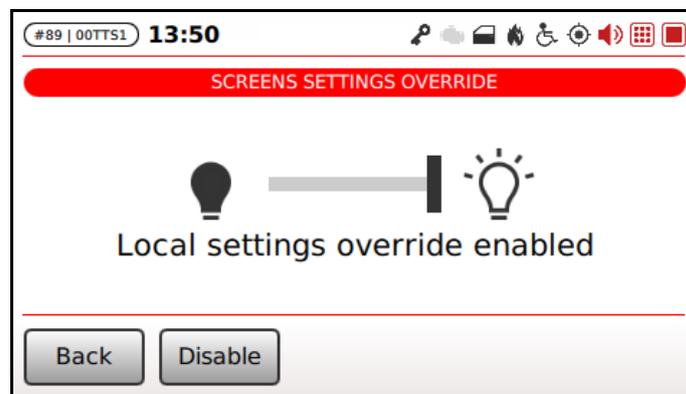


Figure 88: Screens setup local override

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.6.2 Screens brightness

If screens local settings override is enabled (paragraph 9.6.1) then the brightness of screens can be configured by accessing “Setup → Screens setup → Brightness” (Figure 89).

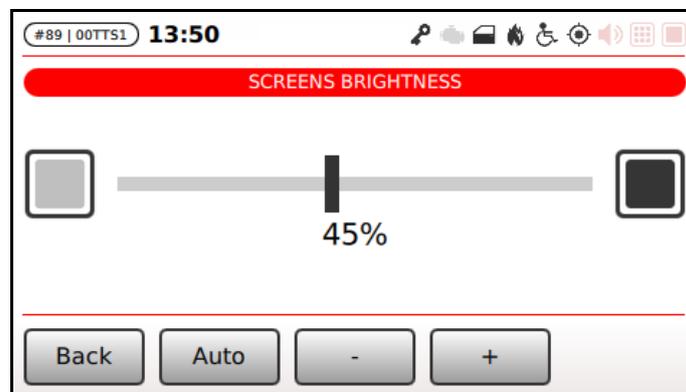


Figure 89: Screens brightness configuration

Soft key labeled “Auto” toggles between automatic and manual mode.

In automatic mode screens automatically adjust their brightness depending on the detected environmental light.

In manual mode the brightness percentage of all screens is configured by the slider shown in Figure 89 (soft keys “-” and “+” can be used in order for respectively decreasing or increasing the brightness of screens).

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.6.3 Screens audio volume

The volume of screens can be configured by accessing “Setup → Screens setup → Volume” (Figure 90).

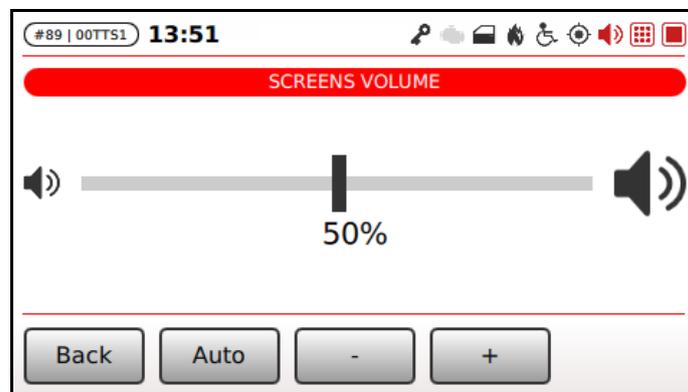


Figure 90: Screens audio volume configuration

Soft key labeled “Auto” toggles between automatic and manual mode.

In manual mode the volume percentage of all screens is configured by the slider shown in Figure 90 (soft keys “-” and “+” can be used in order for respectively decreasing or increasing the volume of screens).

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting the menu.

9.6.4 Media playlist switch

The screen at “Setup → Screens setup → Media playlist switch” (Figure 91) can be used for selecting which is the source of the multimedia playlist to be reproduced by Aesys® on-board LCD/TFT screens connected to the system.

Options are:

- *Media*: the multimedia playlist reports the media files manually selected by the bus driver (paragraph 7.1.6);
- *CMS*: the multimedia playlist is driven by the CMS channel currently configured on the system (paragraph 9.8.7).

The selection can be toggled by tapping “Toggle” or the switch reported on the screen.



Figure 91: Media playlist switch selection

9.6.5 PIS playlist switch

The screen at “Setup → Screens setup → PIS playlist switch” (Figure 92) can be used for selecting which is the source of the passenger information (PIS) playlist to be reproduced by Aesys® on-board LCD/TFT screens connected to the system.

Options are:

- *MME package*: the PIS playlist reports the media files referred by the MME package currently available on the system (paragraph 7.1.3);
- *CMS*: the PIS playlist is driven by the CMS channel currently configured on the system (paragraph 9.8.7).

The selection can be toggled by tapping “Toggle” or the switch reported on the screen.

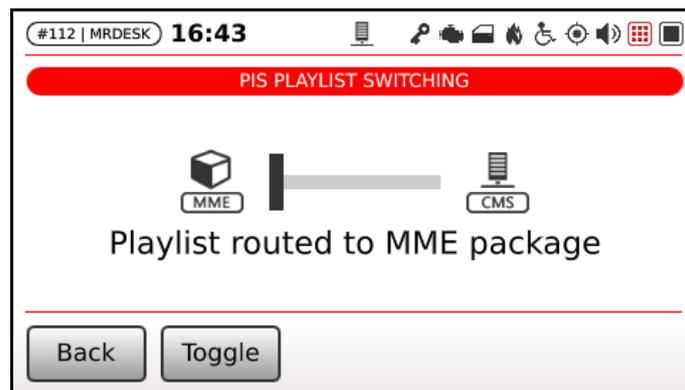


Figure 92: PIS playlist switch selection

9.7 I/O Setup

TC-430™ manages 4 digital inputs, for respectively monitoring the status of the following devices/equipments:

- the status of the bus doors (opened or closed);
- the status of the emergency button/pedal (pressed or not pressed);
- the status of the bus engine (on or off);
- the status of the wheelchair lift (active or inactive).

Depending on the specific hardware available on-board and on specific cabling, the logical level of those signals might be adjusted for matching the real status of such devices/equipments.

The configuration can be made by accessing “Setup → I/O setup” (Figure 93).

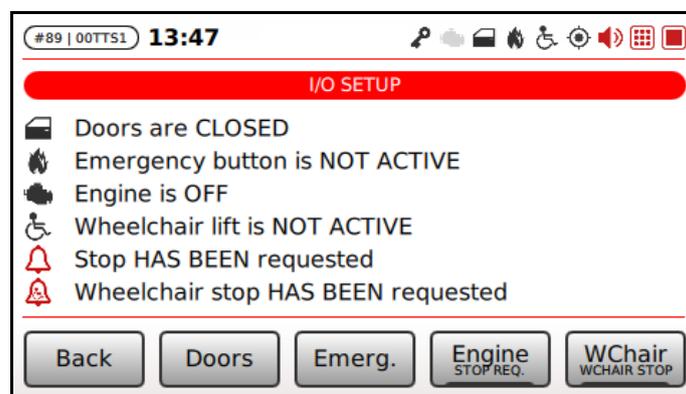


Figure 93: I/O setup

“Doors”, “Emerg.”, “Engine”, “WChair”, “Stop req.”, “WChair stop” can be pressed for respectively toggling the logical status of bus doors, emergency button/pedal, bus engine and wheelchair lift (the logical status of devices/equipments can also be toggled by tapping the correspondent icon on the left side of the touch-screen), stop request and wheelchair stop request.

Signals should be toggled until the description of devices/equipments status match the real condition of the systems (e.g., if the I/O configuration is performed while bus doors are open then the correspondent description reported in Figure 93 should tell “Doors are OPENED”).

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menu.

9.8 Interfaces setup

9.8.1 Bus identification

TC-430™ can connect via wireless network to Verba 2014™, in order to receive data definition files and/or commands issued by remote.

For being Verba 2014™ able to identify any bus, it is requested that an unique code is assigned to each bus, corresponding to the buses base data programmed in Verba 2014™ itself.

The bus identification code (6 alphanumeric characters) can be configured by accessing “Setup → Interfaces setup.. → Bus identification” (Figure 94).

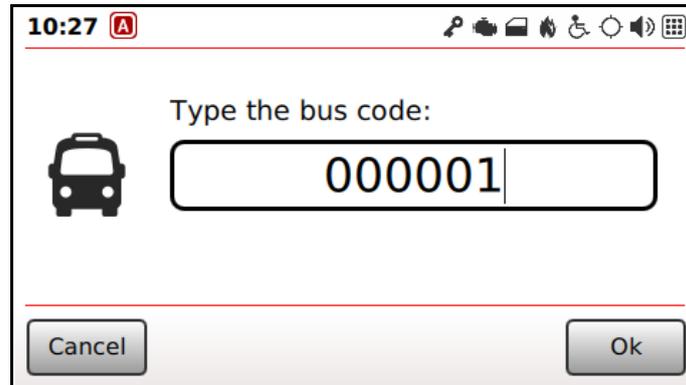


Figure 94: Bus identification code configuration

9.8.2 Cloud setup

TC-430™ introduced the support to Aesys® cloud connection. Please notice that the support is still *EXPERIMENTAL* and it is not intended for productive environment (even because Aesys® cloud infrastructure has not been deployed to production too).

Anyway, cloud connection can be configured by accessing “Setup → Interfaces setup → Cloud setup” (Figure 95).

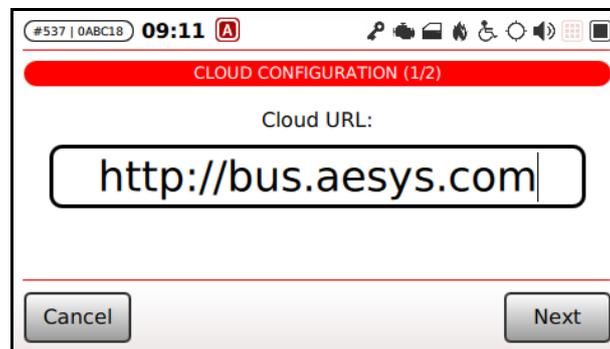


Figure 95: Cloud configuration

Cloud configuration basically resolves in cloud URL configuration (please get in touch with Aesys® for details about that).

Cloud connection is disabled by simply specifying an empty cloud URL.

Cloud configuration is changed upon pressure over “Ok”.

9.8.3 Ethernet setup

TC-430™ can communicate with other on-board devices exploiting a network connection (Gigabit Ethernet). The wired network interface can be configured by accessing “Setup → Interfaces setup → Ethernet setup” (Figure 96).

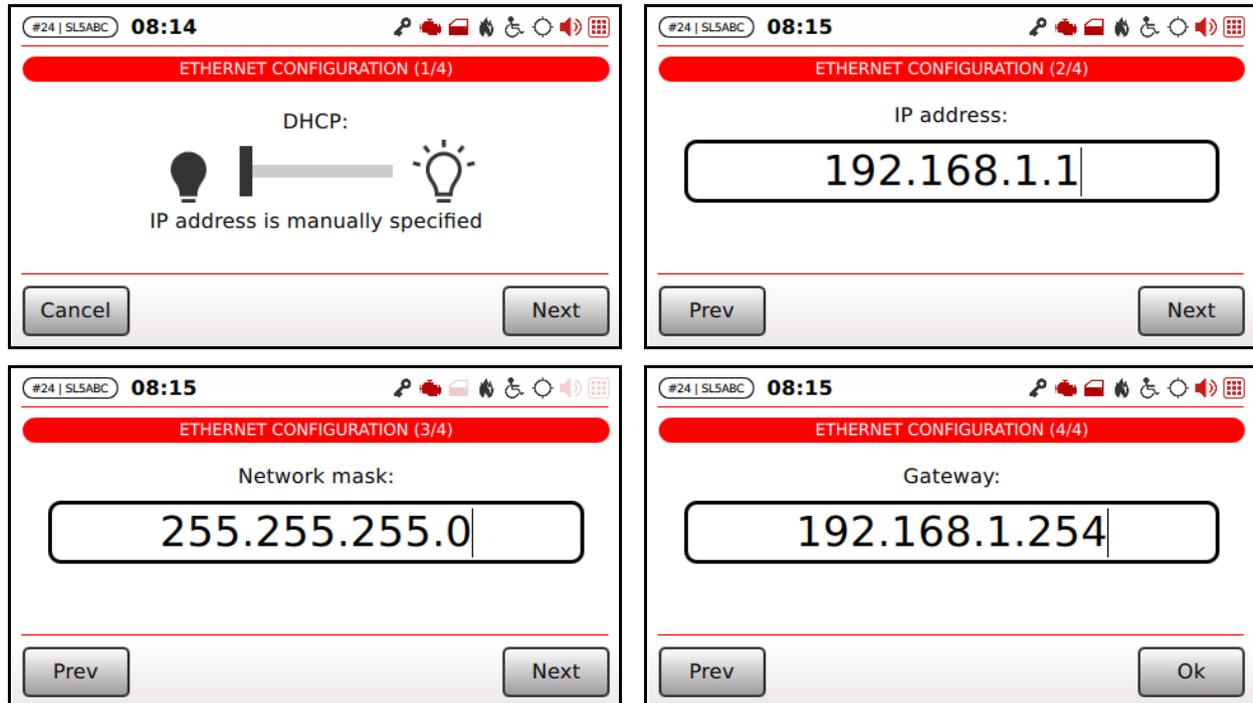


Figure 96: Ethernet configuration

Ethernet configuration is made up by 4 steps, respectively for configuring the DHCP, the IP address, the network mask and the gateway (Figure 96).

If DHCP is enabled then further configuration steps are not requested and “Next” soft key is turned into “Ok” for just confirming DHCP enabling (DHCP can be toggled just by tapping the correspondent switch on the touch-screen).

TC-430™ is shipped from factory having static IP 192.168.1.1/24 configured (no gateway).

Network configuration is changed upon pressure over “Ok”: if no errors messages are reported after that, then Ethernet configuration has been successfully completed.

9.8.4 Wireless settings override

TC-430™ exploits a 802.11 b/g/n wireless network adapter in order to connect to other equipments (on-board and/or stationary).

TC-430™ can connect to open networks or network protected by WEP (64 or 128 bits), WPA personal (WPA/PSK) or WPA2 Personal (WPA2/PSK).

The wireless interface configuration is normally provided by the data file loaded in the system (paragraph 7.1). Anyway the wireless adapter configuration can be locally overridden by the system administrator.

The override of wireless settings is enabled by accessing “Setup → Interfaces setup → Wireless settings override”. The screen in Figure 97 is shown.

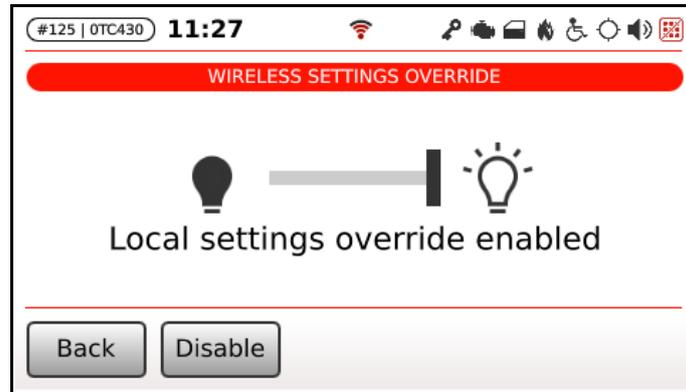


Figure 97: Wireless network local override of settings

Changes are immediately applied (so there is no need to press any “OK” button): simply press “Back” for confirming settings and exiting the menu.

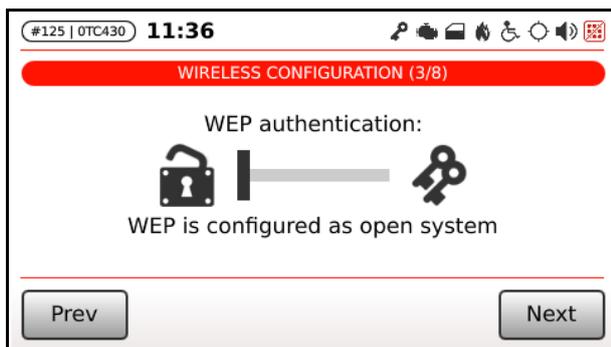
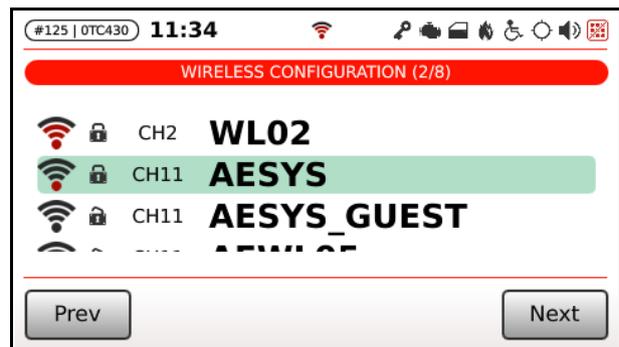
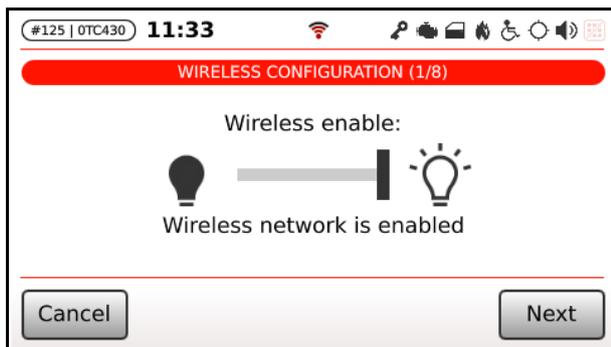


Be aware!

The system remembers the last overridden settings: simply enabling wireless settings override will cause the last overridden settings to be applied to the system.

9.8.5 Wireless setup

If wireless settings override has been enabled (paragraph 9.8.4) then the wireless configuration can be modified by accessing “Setup → Network interfaces → Wireless setup”.



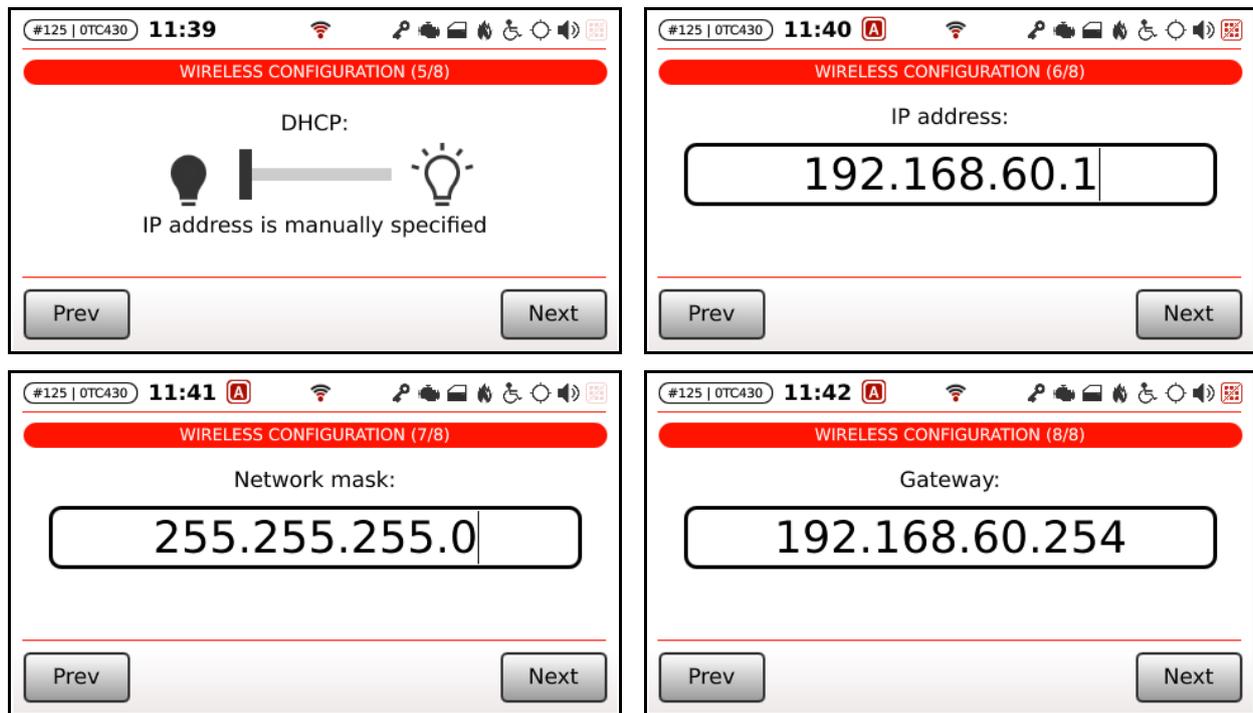


Figure 98: Wireless configuration

Wireless configuration is made up by 8 steps, respectively for enabling the adapter and configuring the network name, the WEP authentication mode, the network password, the DHCP, the IP address, the network mask and the gateway (Figure 96).

If wireless adapter is disabled at step #1 then further configuration steps are not requested and “Next” soft key is turned into “OK” for just confirming.

Step #3 (WEP authentication mode) is only shown if the network selected at step #2 is WEP-protected (no need to specify WEP authentication mode for open, WPA/PSK or WPA2/PSK networks).

If DHCP is enabled at step #5 then further configuration steps are not requested and “Next” soft key is turned into “OK” for just confirming DHCP enabling (DHCP can be toggled just by tapping the correspondent switch on the touch-screen).

Wireless configuration is changed upon pressure over “OK”: if no errors messages are reported after that, then wireless configuration has been successfully completed.

9.8.6 External router

Aesys® TC-430™ can be connected to central server through a router connected via Ethernet cable to the control unit. In such a scenario the external router is used *instead* of internal TC-430™ wireless adapter.

The availability of an external router is usually configured trough Verba 2014 [1]; anyway if wireless settings override has been enabled (paragraph 9.8.4) then the router configuration can be modified by accessing “Setup → Network interfaces → Router”.

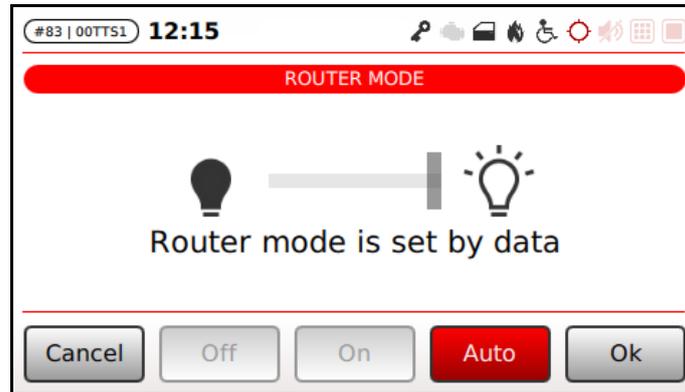


Figure 99: External router configuration

Soft key labeled “Auto” toggles between automatic and manual mode (while in automatic mode the router availability is driven by the current data file, as programmed in Aesys® Verba 2014™ [1]).

In manual mode, the router availability can be forced (by hitting “On”) or disabled (by hitting “Off”), or moving/clicking the slider shown in Figure 99.

Changes are saved by clicking “Ok”.



Be aware!

The control unit establishes a TCP-based connection while in external router mode (for getting rid of UDP-related limitations enforced by some telecom operators while going 3G/4G) while makes use of a communication protocol based on UDP while using the internal wireless adapter.

This fact implies that the control unit tries to connect to the central server UDP IP/port specified for Wi-Fi connection in the latter case and tries to connect to the central server TCP IP/port specified for GPRS while using the external router.

9.8.7 CMS

Aesys® TC-430™ is able to interoperate the Aesys® CMS for multimedia contents (Aesys® Creo™). The configuration of the interface towards the CMS can be adjusted by accessing “Setup → Interfaces setup → CMS”.



Note

The description of Aesys® Creo™ goes far beyond the scope of this document; please refer to Aesys® customer service for more details about it.

9.8.7.1 Mode

The CMS can be configured for working in one of the following modes:

- *Automatic*: the URL of the CMS channel to download content from is provided by the data file (VDB) currently loaded in the control unit;

- *Manual*: the URL of the CMS is manually typed by an operator on TC-430® keypad (see paragraph 9.8.7.2);
- *USB*: a CMS channel has been uploaded to the control unit by the means of an USB key (see paragraph 7.1.3).

The selection of the mode is operated by accessing “*Setup* → *Interfaces setup* → *CMS* → *Mode*” (Figure 100).



Figure 100: CMS mode selection

**Be aware!**

USB mode cannot be actually selected by the operator using the menu in Figure 100; instead USB mode is triggered when uploading a CMS channel through USB key, as described in paragraph 7.1.3.

9.8.7.2 CMS channel URL

When the CMS mode is in manual mode (see paragraph 9.8.7.1) the URL of the CMS channel the control unit should synchronize with is specified by accessing “*Setup* → *Interfaces* → *CMS* → *Channel URL*” (Figure 101).

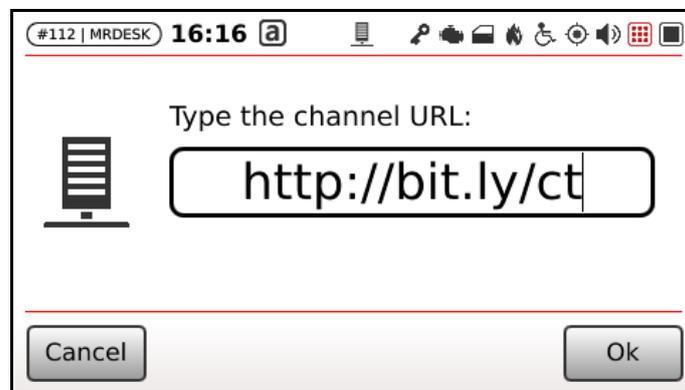


Figure 101: CMS channel URL configuration (manual mode)

**Be aware!**

The configuration of the CMS channel URL is only available when the CMS mode is “Manual”.

9.8.8 Protocol KC-2S-U

TC-430™ can communicate with other on-board equipments exploiting the well-established Aesys® KC-2S-U protocol (as specified in [2]).

Depending on configuration, the KC-2S-U protocol is server on RS-232, RS-485 and/or network interfaces on UDP port 6002 (by default the KC-2S-U protocol is enabled on all the listed interfaces; please refer to Aesys® technical support for disabling KC-2S-U on some interfaces).

Protocol KC-2S-U can be tweaked by accessing “Setup → Interfaces setup → Protocol KC-2S-U”.

9.8.8.1 Protocol version

TC-430™ can recognize both version 1.1.0.0 and 2.0.2.0 of the KC-2S-U protocol and can automatically switch between the versions depending on commands received by the counterpart. Anyway the current protocol version can be review/configured by accessing “Setup → Interfaces setup → Protocol KC-2S-U → Protocol version” (Figure 102)

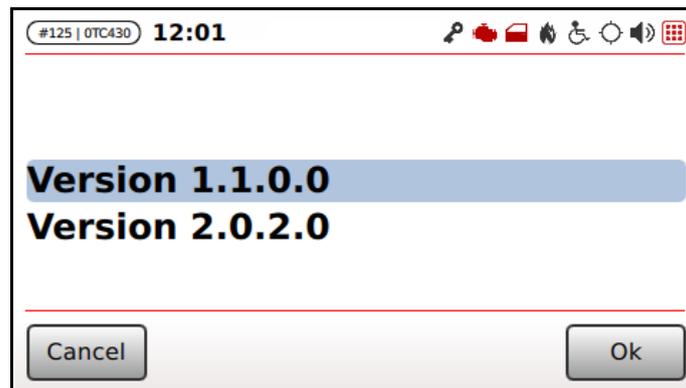


Figure 102: Protocol KC-2S-U version configuration

9.8.8.2 Internal sign type

For allowing the TC-430™ to exploit some features of the KC-2S-U protocol the type of the internal sign (if any) has to be configure through “Setup → Interfaces setup → Protocol KC-2S-U → Internal sign type” (Figure 103).

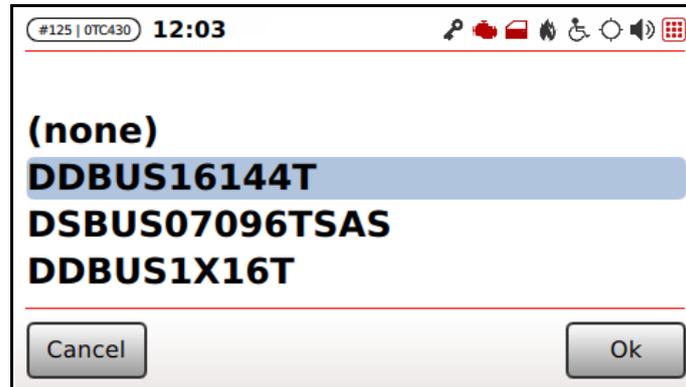


Figure 103: Protocol KC-2S-U internal sign type configuration

Please refer to Aesys® customer service for further support about internal sign type configuration.

9.8.8.3 Serial baud-rate

The baud-rate being used by the KC-2S-U protocol while served over serial channel (RS-232 or RS-485) can be respectively configured accessing “*Setup → Interfaces setup → Protocol KC-2S-U → RS-232 baud rate*” and “*Setup → Interfaces setup → Protocol KC-2S-U → RS-485 baud rate*” (Figure 104).

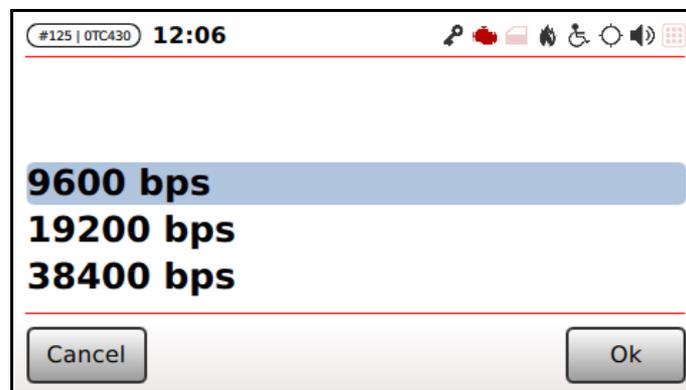


Figure 104: Protocol KC-2S-U baud rate

Protocol KC-2S-U is normally served at 9600 bps over serial line.

9.8.9 J1708

TC-430™ support to J1708 protocol can be configured by accessing “*Setup → Interfaces setup → J1708*”.

9.8.9.1 Codes length

The length of destination, P/R codes and route text to be used while exchanging data with the J1708 counterpart can be configured by accessing “*Setup → Interfaces setup → J1708 → Codes length*” (Figure 105).

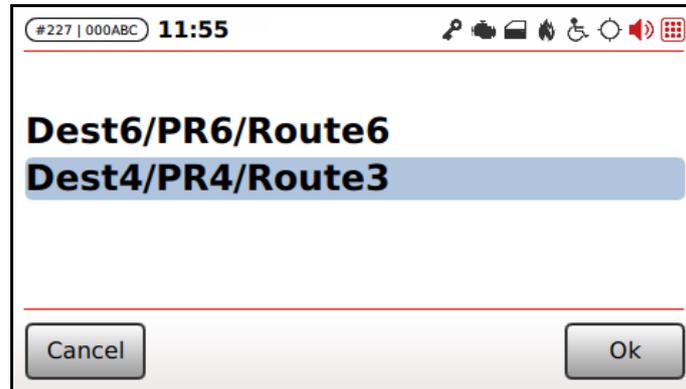


Figure 105: Configuration of J1708 codes length

Currently two options are supported:

- “Dest6/PR6/Route6” (6 characters for destination codes, 6 characters for P/R codes, 6 characters for route texts);
- “Dest4/PR4/Route3” (4 characters for destination codes, 4 characters for P/R codes, 3 characters for route texts).

The latter option is the default one for retro-compatibility reasons (with respect to Aesys® KC-640 control units).

9.8.9.2 Dash sign command

Dash sign (when enabled, see paragraph 9.4.5) can be handled through the J1708 interface by the means of distinct commands. The command expected by TC-430™ can be configured by accessing “Setup → Interfaces setup → J1708 → Dash sign command” (Figure 106).

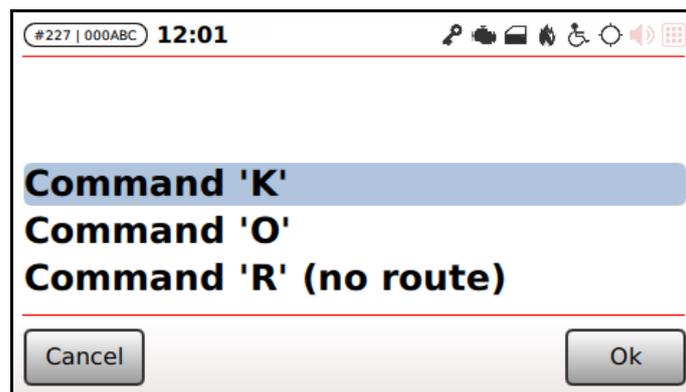


Figure 106: Configuration of J1708 dash sign command

The dash sign can be configured for listening to J1708 “Command K”, “Command O” or “Command R” (in the latter case being the “R” command normally used for route numbers, selecting it for dash sign automatically disabled the usage of the same command for route numbers).

9.8.9.3 J1708 sniffer

TC-430™ integrates a J1708 sniffer utility which can be triggered by accessing “Setup → Interfaces setup → J1708 → J1708 sniffer” (Figure 107).

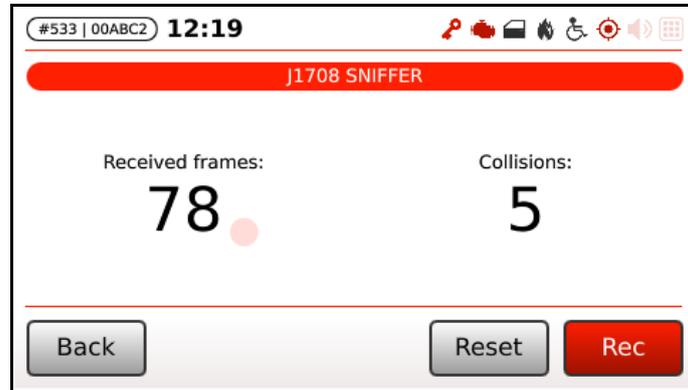


Figure 107: J1708 sniffer

Basically the sniffer shows the count of frames received and recognized by TC-430™ as valid J1708 protocol frames and the number of transmission collisions detected (only the collisions which involve the TC-430™ are counted, not the collisions regarding other couple of equipments).

In a normal scenario (J1708 cable properly connected and system working) the counter of received frames should increase its value as long as some equipment exchange data over the J1708 bus. The number of collisions may vary or not depending on the set of J1708 equipment available on board as well as their level of conformance with respect of the protocol.

Counters can be reset hitting the “Reset” button.

The TC-430™ J1708 sniffer allows to “record” a trace of data exchanged on the J1708 bus. Hitting the button “Rec” the recording begins. While recording, a blinking warning label is shown on the screen and the right-most button is turned into “Stop” (Figure 108).

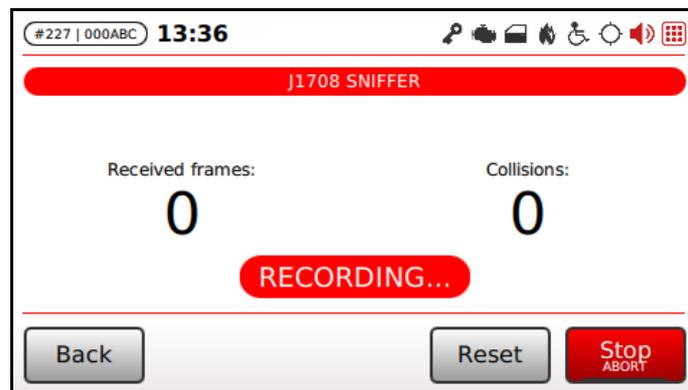


Figure 108: J1708 sniffer recording

Hitting “*Stop*” causes the recording to be stopped: TC-430™ ask for the path and the file name to store the trace to (an USB mass storage connected to the control unit is requested for complete this step): a default “.j1708” file extension is appended automatically to the selected file name.

An on-going recording can be aborted (stopped and its content discarded) by holding the “*Stop*” button for a while until the corresponding animation completes.

9.9 Control unit

9.9.1 Language

TC-430™ language can be configured accessing “*Setup* → *Control unit* → *Language*” (Figure 109).

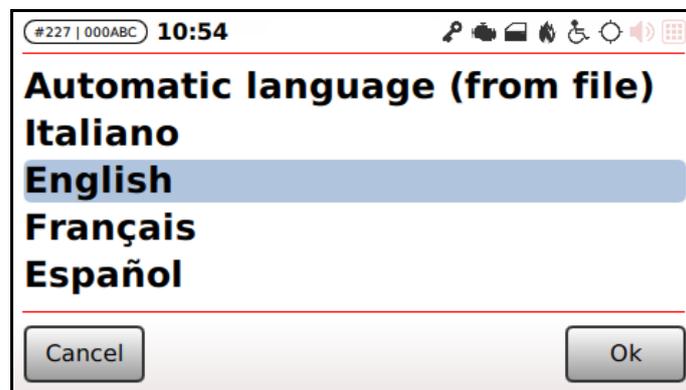


Figure 109: System language

The option “*Automatic language (from file)*” can be selected for using the language specified by the data file currently being loaded on TC-430™.



Be aware!

For retro-compatibility reasons the full set of languages originally supported by Aesys® KC-640™ control units is shown, but at the moment of writing only English, Italian and Spanish languages are truly supported: selecting a language different from one of those will lead the control unit to use English instead.

9.9.2 Mode

TC-430™ can work in various modes depending on the context/customer where it is to be used.

The mode to be applied can be selected by accessing “*Setup* → *Control unit* → *Mode*” (Figure 113).

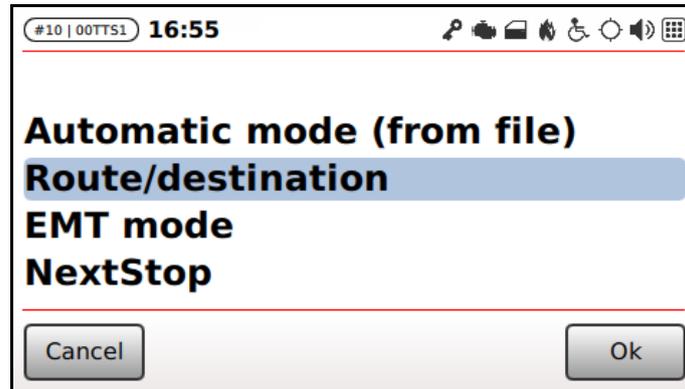


Figure 110: Working mode configuration

For every mode TC-430 has a specific behavior and also a specific user interface.

9.9.3 Route management

TC-430™ supports the legacy route management as well (as it was for Aesys® KC-640™ control unit). While route management is enforced by the control unit, the system tries to replace a sequence of given characters in the destination sign implementations with the number of the current route being handled by the system (the current route number can be typed by the driver or received from an external system).

The route management can be toggled accessing “Setup → Control unit → Toggle route” (Figure 111).

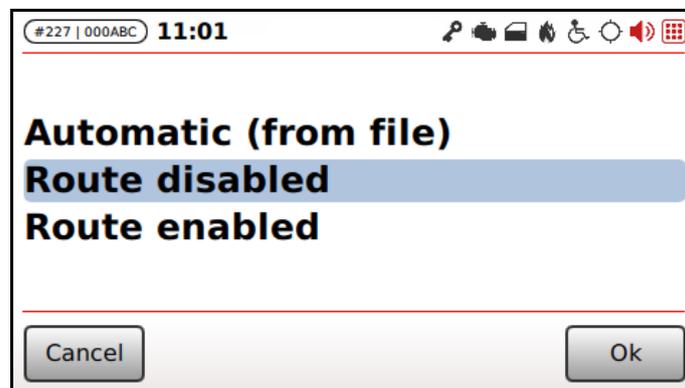


Figure 111: Toggle route management

The option “Automatic (from file)” can be used for enabling/disabling route management depending on the options specified in the data file currently being handled by the system.

The configuration of the character in destination signs to be replaced with current route number can be made accessing “Setup → Control unit → Route character” (Figure 112).

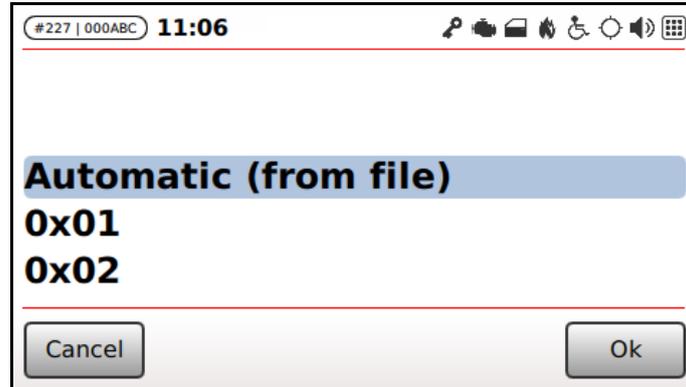


Figure 112: Route character configuration

Otherwise differently instructed to, it is generally safe to keep this option to “Automatic (from file)”.

9.9.4 Idling time

TC-430™ goes to idle state after a configurable interval of time since the last interaction of the system user (keypad or touch-screen activity).

While in idle mode the brightness of both the touch-screen and the keypad is dimmed (only if TC-430™ is not in administrative mode, that is only if TC-430™ “Setup” menu has not been entered).

The interval of time for going to idle mode can be configured by accessing “Setup → Control unit → Idling time” (Figure 113).

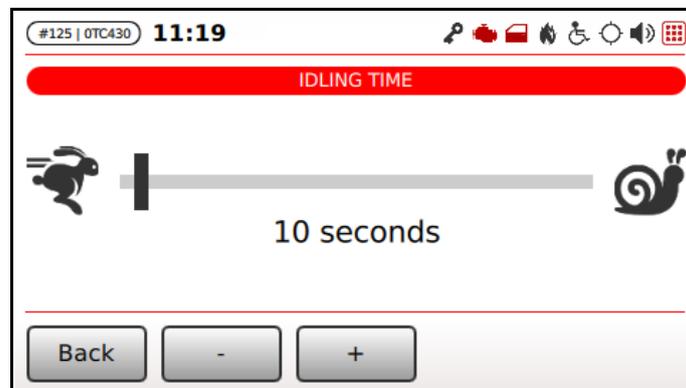


Figure 113: Idling time configuration

The time interval for going to idle mode can be configured by dragging the slider in Figure 113 on the touch screen, or by pressing “-” and “+” for respectively decreasing or increasing the interval.

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menu.

9.9.5 Touch-screen and keypad brightness

The brightness of both the touch-screen and the keypad can be adjusted by accessing “Setup → Control unit → Brightness” (Figure 114).

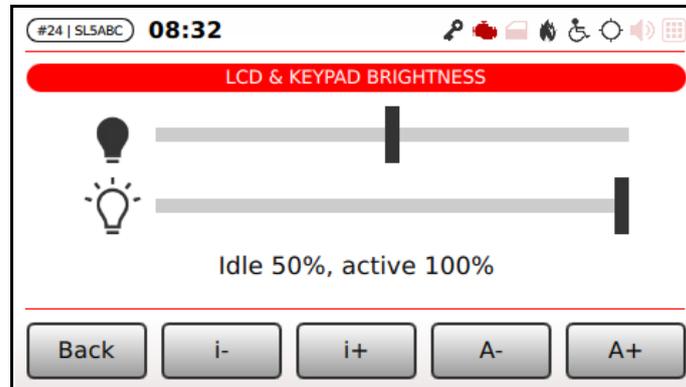


Figure 114: Touch-screen and keypad brightness configuration

Touch-screen and keypad brightness can be independently configured for system active status and system idle state (see paragraph 9.9.3), being the brightness level of the former state always greater or equal to the latter one.

The first slider shown in Figure 114 refers to the brightness percentage of touch-screen and keypad while the system is idling, while the second slider refers to the active mode of the system. Brightness levels can be adjusted by dragging the sliders the touch screen, or by pressing “i-”, “i+”, “A-” and “A+” for respectively decreasing or increasing the idling brightness level and the brightness level while in active mode.

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menu.



Tip

Touch-screen and keypad brightness configuration is quickly accessible by holding for some seconds the key “Aesys” on TC-430™ keypad.

9.9.6 Night mode

Aesys® TC-430™ can be turned into night mode in order to greatly reduce the amount of light coming from the unit (e.g. during night travels).

Night mode can be quickly toggled by pressing “Aesys” button on TC-430™ keypad.

Figure 115 shows a sample screen in night mode.



Figure 115: Night mode

9.9.7 Keypad color

TC-430™ manages a configurable keypad colorization which may differ from driver mode (the normal mode the system enters at start-up) and the administrative mode (accessed by the “Setup” menu).

The colorization of the keypad in driver mode can be configured by accessing “Setup → Control unit → Keypad → Keypad color” (Figure 116).

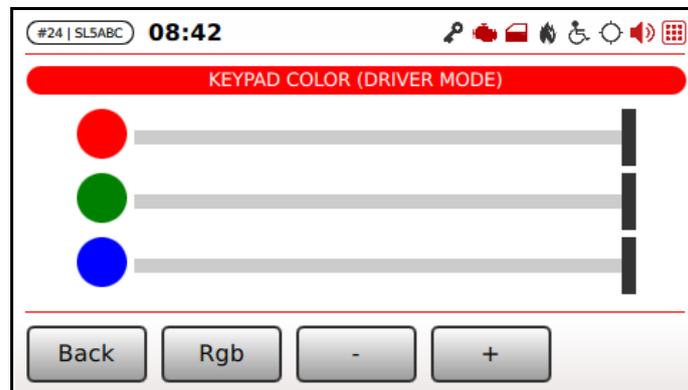


Figure 116: Driver mode keypad color configuration

The color can be adjusted by simply dragging the sliders corresponding to the red, green and blue components on the touch-screen, or by using soft keys (“Rgb” selects the active component, which is marked by the capital letter on the soft key itself, while “-” and “+” respectively decreasing or increasing the current value of the selected slider). Even if currently within the “Setup” menu, the color of the keypad is turned to “driver mode” while configuring it, for having a preview of its appearance.

Similarly the colorization of the keypad in administrative mode can be configured by accessing “Setup → Control unit → Keypad → Keypad admin color” (Figure 117).

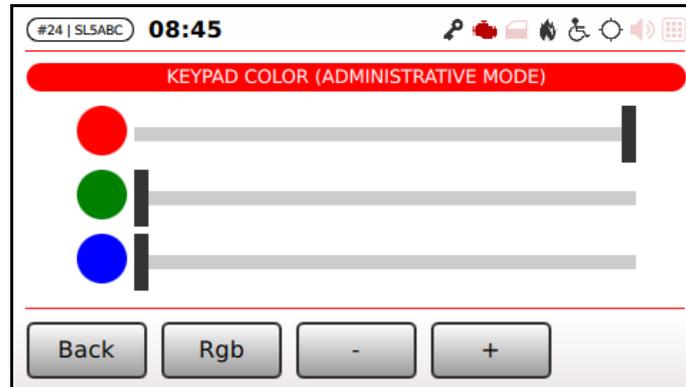


Figure 117: Administrative mode keypad color configuration

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menus.

9.9.8 Keypad beep

TC-430™ keypad and soft keys may produce a beep (or “click”) at every user interaction.

This feature can be turned-off by accessing “Setup → Control unit → Keypad → Keypad beep” (Figure 118).

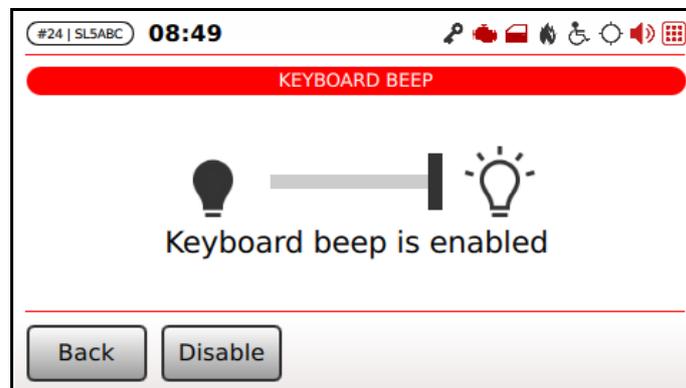


Figure 118: Keypad beep configuration

Beep can be toggled by tapping the correspond switch on the touch-screen or by pressing the soft key alternatively labeled “Enable” or “Disable”.

Changes are immediately applied (so there is no need to press any “Ok” button): simply press “Back” for confirming settings and exiting menu.

9.9.9 Stop request: driver messages duration

TC-430™ control unit can be configured in order to show some message to the driver for notifying the stop request (and also wheelchair stop request), as described in paragraph 11.3.

The duration of stop request messages can be configured at “Setup → Control unit → Stop request message”.

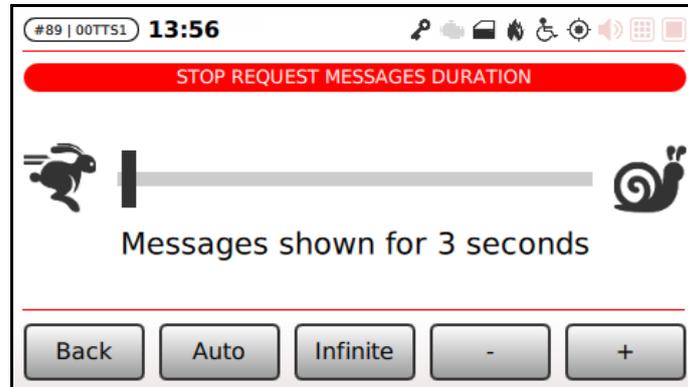


Figure 119: Stop request messages duration configuration

The message duration can be configured to a fixed duration (by dragging the slider shown in Figure 119) or to “*Infinite*”; when “*Infinite*” the driver is requested to manually dismiss stop request-related messages.

The messages duration can be configured by dragging the slider on the touch screen, or by pressing “-” and “+” for respectively decreasing or increasing the interval.

Dragging the slider to zero seconds, implies disabling the stop request messages for driver (reminder icon will always be shown as specified in paragraph 11.3).

The duration of stop request messages for the driver can also be retrieved from the current data file, simply by selecting “*Auto*”.

Changes are immediately applied (so there is no need to press any “*Ok*” button): simply press “*Back*” for confirming settings and exiting menu.

10. Administrative tasks

10.1 Maintenance

10.1.1 Software upgrades

**Be aware!**

Software upgrade is a critical operation: problems or errors occurring during the upgrade process might make TC-430™ unusable.

Please pay attention and only apply software upgrades directly suggested by Aesys®.

TC-430™ software can be upgraded selecting “*Setup → Maintenance → Load new software*”. The screen in Figure 120 is shown for allowing the selection of the software upgrade file to be applied.

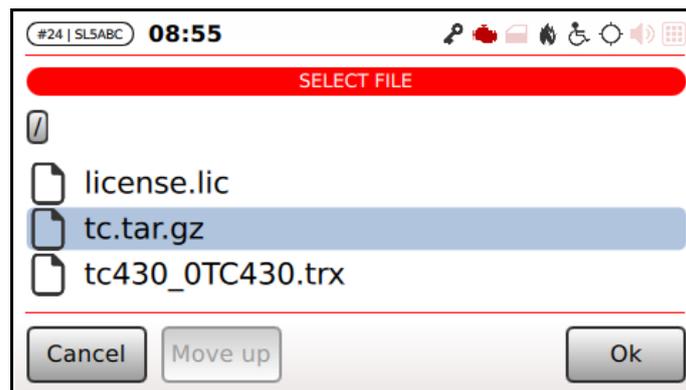


Figure 120: Software upgrade file selection

Software upgrades are usually shipped as “.tar.gz” files, but this might change (please refer to Aesys® technical support for having the latest software upgrades for TC-430™).

The software upgrade is commenced by selecting the proper file and pressing “Ok”; the screen reported in Figure 121 is shown for notifying that the software is about to be restarted during the upgrade process.

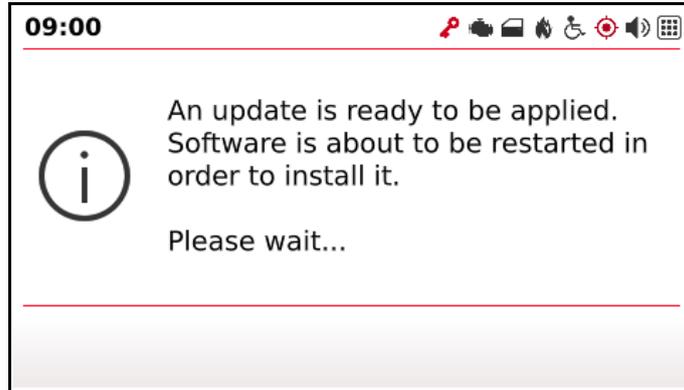


Figure 121: Software upgrade progress

The screen in Figure 122 is shown while processing the upgrade file. During software upgrade elaboration no interaction with TC-430™ is possible.

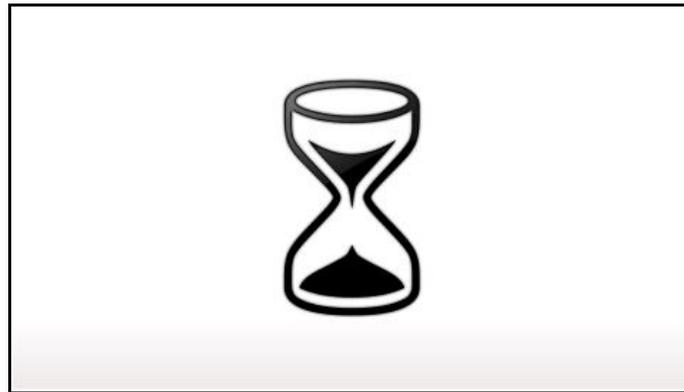


Figure 122: Please wait while applying software upgrade

When software upgrade process completes, the upgraded software version is started (the version of the software being used can be reviewed as described in paragraph 8.1).

10.1.2 Firmware upgrades



Be aware!

Firmware upgrade is a critical operation: problems or errors occurring during the upgrade process might make TC-430™ unusable.

Please pay attention and only apply firmware upgrades directly suggested by Aesys®.

TC-430™ firmware can be upgraded selecting “*Setup → Maintenance → Load new firmware*”. The screen in Figure 123 is shown for allowing the selection of the firmware upgrade file.

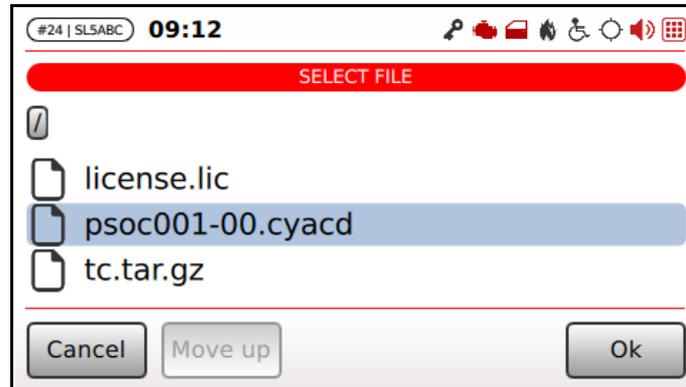


Figure 123: Firmware upgrade file selection

Firmware upgrades are usually shipped as “.cyacd” files, but this might change (please refer to Aesys® technical support for having the latest firmware upgrades for TC-430™).

The firmware upgrade is commenced by selecting the proper file and pressing “Ok”; the screen reported in Figure 123 is shown while firmware upgrade is in progress. During firmware upgrade elaboration no interaction with TC-430™ is possible.

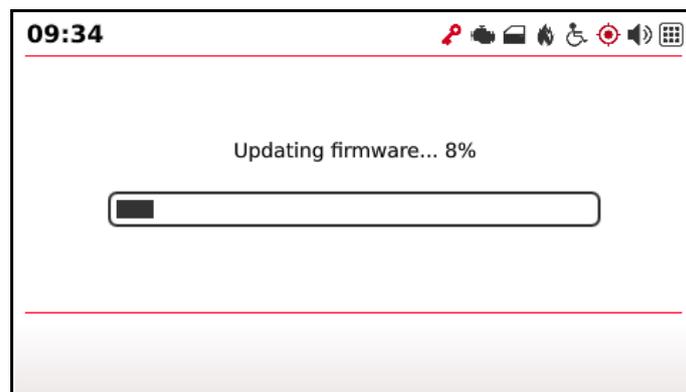


Figure 124: Firmware upgrade process

When firmware upgrade process completes, TC-430™ is restarted with the upgraded firmware (the version of the firmware being used can be reviewed as described in paragraph 8.1).

10.1.3 Touch-screen recalibration

TC-430™ is normally calibrated at the factory and no further maintenance should be necessary. Anyway if the touch-screen becomes somehow inaccurate it is possible to repeat the calibration again by simply selecting “Setup → Maintenance → Recalibrate touchscreen”.

The screen in Figure 125 is shown in order to notify that the system has to be rebooted in order to recalibrate the touch-screen. Press “Calibrate” for proceeding.

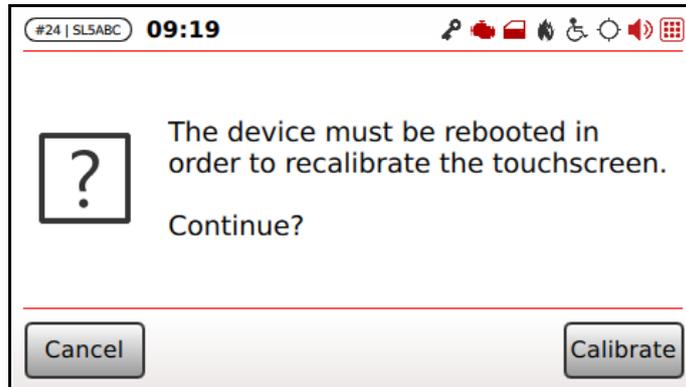


Figure 125: Touch-screen recalibration

Figure 126 shows the calibration process. Basically the touch-screen has to be subsequently tapped in correspondence of the gunsights proposed by the system (5 points have to be tapped).

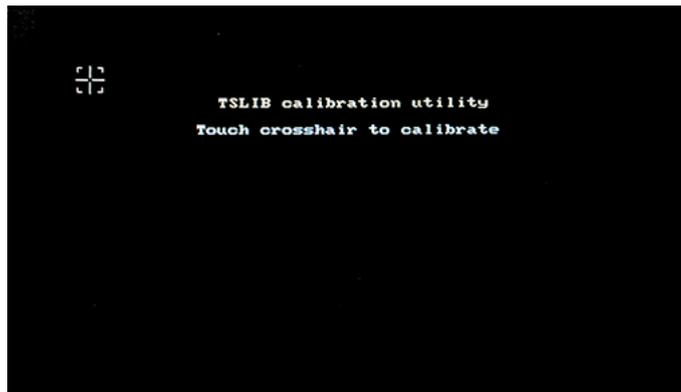


Figure 126: Touch-screen calibration process

At the end of the calibration process, TC-430™ software is automatically restarted.

10.1.4 Factory defaults

TC-430™ factory defaults can be restored selecting “Setup → Maintenance → Restore factory defaults” (Figure 127).

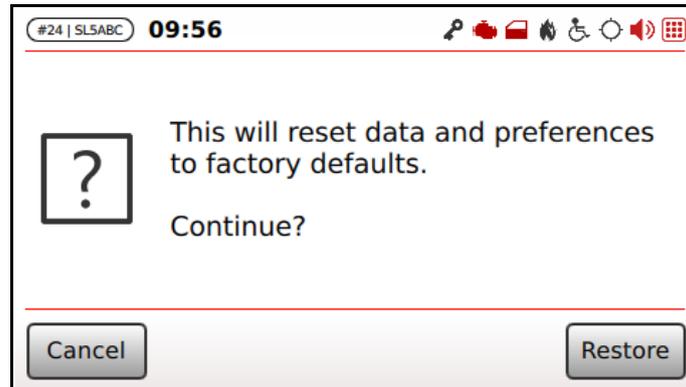


Figure 127: Factory defaults restore

Pressing “Restore” all user preferences and data are reset to factory defaults.

10.1.5 Serial number configuration

The serial number configuration is normally made at factory and there is no need to configure it twice. Menu entry “Setup → Maintenance → Set serial number” is only enabled at Aesys® factory in order to let the personnel (re-)program the serial number of the device.

10.1.6 Log files saving

The log files generated by the TC-430™, containing all the log messages, can be saved as a compressed archive (tar.gz) to an USB pen drive. The log files saving is started just connecting a USB key to the control unit and selecting “Setup → Maintenance → Save logs”.

The screen in Figure 125 is shown.

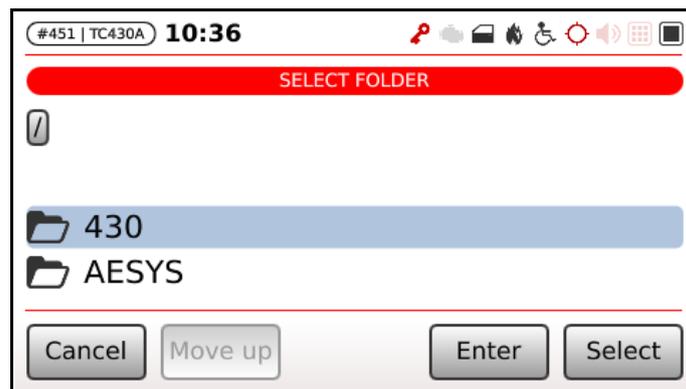


Figure 128: Select folder

After having selected the folder, just pressing the “Select” button, TC-430™ will show another screen asking for the desired file name. The screen in Figure 126 is shown.



Figure 129: Type file name

The saving on usb stick starts when the “Ok” button is pressed and causes a waiting message to be displayed. When the saving is finished, a message of successful saving is displayed.

11. Miscellaneous

11.1 Devices failures

TC-430™ continuously monitors the health of connected Aesys® devices, such as LED signs and vocalizers. Devices status is reported by proper icons shown in the status bar (paragraph 6.) and/or by dedicated diagnostics screens (paragraphs 8.3 and 8.4).

Anyway, major issues are also reported to the driver through full screen messages, for recalling his attention (Figure 130).

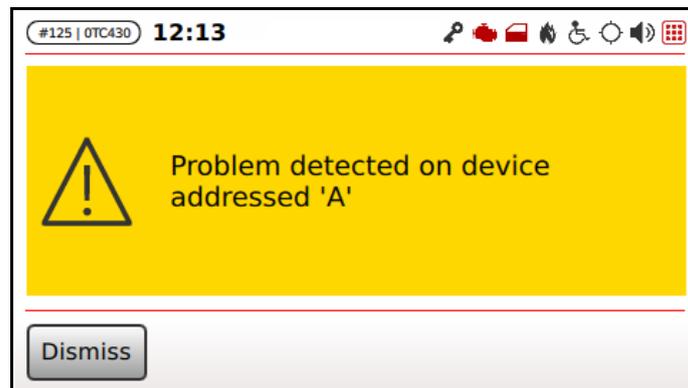


Figure 130: Device failure screen

A message is shown for every failed device (identified by its own logical address). If a device enters/exits the failure conditions several times, then the full-screen message is shown only at first failure (since the TC-430™ boot or the loading of a new data file).

11.2 Events handling

TC-430™ can monitor the current status of bus doors and wheelchair lift, if available and if connected to the system. Please refer to TC-430™ installation and cabling documentation for further details about connections and refer to paragraph 9.6 for signals configuration.

The following screens (Figure 131) are overlapped to the current visualization every time the doors are opened or when the wheelchair lift becomes active.

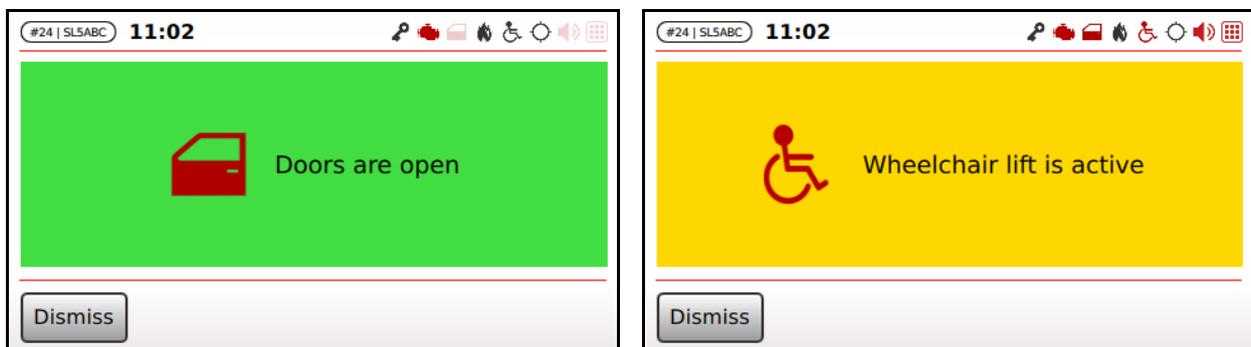


Figure 131: Events handling

Notification screen can be manually dismissed by the driver by pressing “Dismiss” or are automatically dismissed as soon as the event that originated them goes back (notification screens will be shown again next time the corresponding events occur).

If both doors are opened and wheelchair lift is active, then wheelchair lift notification takes precedence over the doors notification.

11.3 Stop request

TC-430™ can be connected to the bus on-board stop request system, in order to provide visual and audio feedback about the request to both driver and passengers.

The control unit can differentiate whether the stop request was requested for wheelchairs or not.

Please refer to TC-430™ schematics and service manual for instruction about control unit connection with bus signals.

Screens show in Figure 132 are presented to driver when respectively the stop requested was intended for wheelchairs or not.

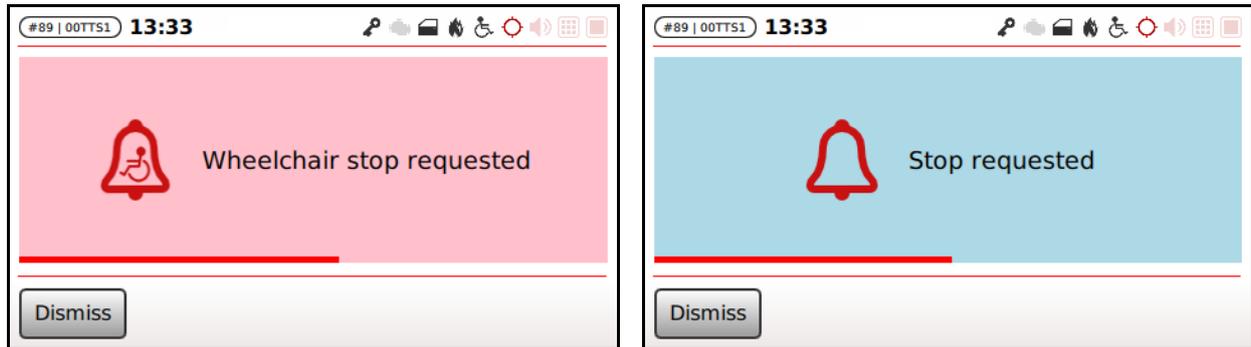


Figure 132: Stop request

Messages shown for the driver about stop request can be configured for automatically closing after an interval of time, or to be manually closed by the driver (hitting “Dismiss” button). The configuration can be modified as specified in paragraph 9.9.9. Anyway the message is automatically dismissed if the bus equipment notifies that the stop is requested no more.

The notification that the stop was requested is also broadcasted to other bus equipment, as described in paragraph 11.7.1.

The system can also be configured in order to provide an audio feedback about the stop request, exploiting both built-in TTS system or external voice announce equipment. Please refer to [1] for further details about system configuration for having audio feedback for stop requests.

Driver messages (and/or audio feedback) are provided only once per stop, meaning that if the stop is requested several times along the path then messages are not repeated. The only exception about that is the request for a wheelchair stop after a normal stop request: in this case the message for the driver is updated for notifying that the type of the requested stop has been changed (anyway the audio feedback to passengers is only provided only once).

Driver messages (and/or audio feedback) are provided only if the service is not idling, that is only if a trip has been selected (in “Next stop” mode) and/or a destination, or P/R message or info message has been selected (in both “Next stop” and “Route/destination” modes).

If driver messages about stop request have been dismissed (by the driver or automatically) a reminder about the stop request is shown in both the trip (icon next to current stop name) or manual navigation screens (icon next to current destination), as shown in Figure 133.

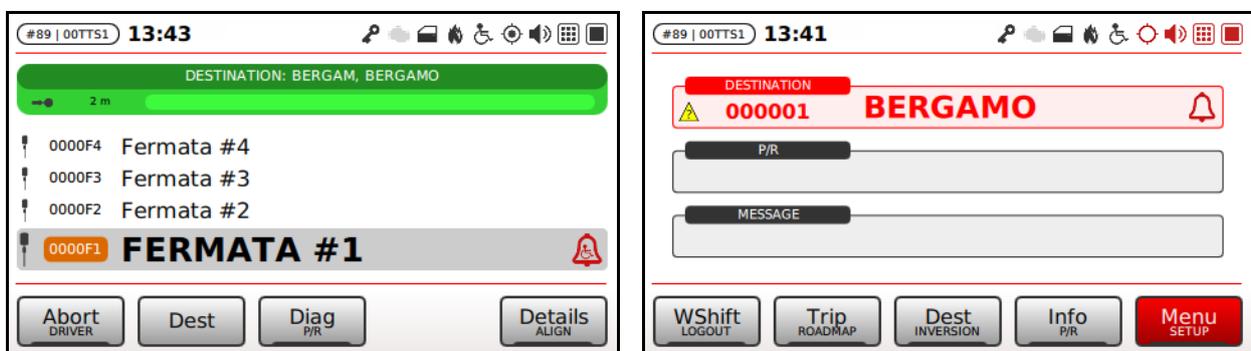


Figure 133: Stop request reminders

The reminder icon includes a wheelchair if the stop was requested for wheelchairs.

11.4 Emergency handling

An emergency button (or pedal) can be connected to the TC-430™ in order to properly handle emergency events on-board (such as robbery or other criminal events). Please refer to TC-430™ installation and cabling documentation for further details about button/pedal connection and refer to paragraph 9.6 for button/pedal status configuration).

TC-430™ enters the emergency mode after a 3-second long press of the button/pedal. The emergency mode is notified by a flashing red emergency icon in the status bar (see paragraph 6.).

When TC-430™ enters the emergency mode the control unit searches for a destination coded “ZZZZZ” within the current data file being used by the system and silently publish it on external bus LED signs (such a destination should implement a message like “CALL 911” or similar); no P/R messages are shown by LED signs during the emergency mode.

If a destination coded “ZZZZZ” cannot be found within the current data file, then the string “CALL 911” is published on external signs using the default font and publication template provided by signs themselves (actual visualization may vary depending on specific LED signs firmware implementations).

Emergency mode can be left long pressing the emergency button/pedal for 10 seconds. When TC-430™ leaves the emergency mode, the emergency icon in the status bar is turned off (paragraph 6.) and normal LED signs publication is restored.

11.5 Data file storage

It is possible to download the current data file from TC-430™ to a USB mass storage device (e.g. for copying the same exact destinations/messages database to another control unit).

Current data file is downloaded by selecting “Menu → Store data file”. Screen in Figure 134 is shown for allowing the user to select the folder on the USB mass storage to download the current data file to.

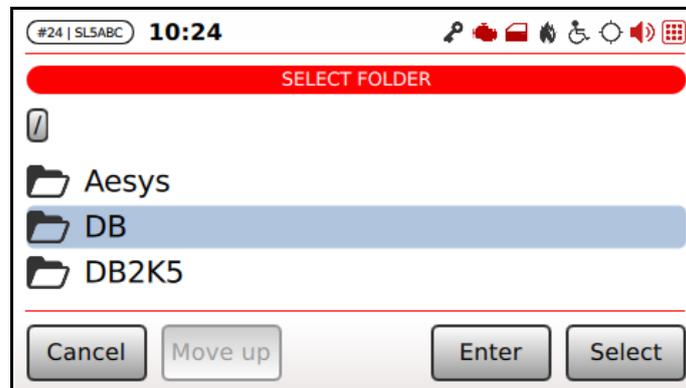


Figure 134: Current data file storage folder selection

“Enter”, “Select”, “Move up” respectively enters, selects and leaves (upward) the current folder. After folder selection the screen in Figure 135 is shown for letting the user decide the name to be assigned to the file to be saved on USB mass storage.

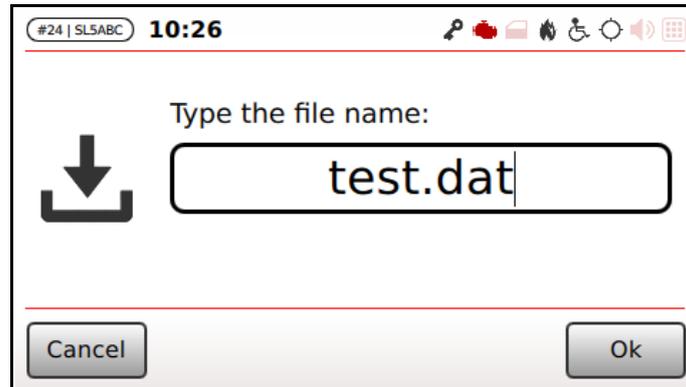


Figure 135: Current data file storage filename selection

Current data file is saved at the specified location upon pressure on “OK”.

11.6 Temporary destination

Under special circumstances it may be desirable that the driver could publish a destination on LED signs which is not contained in the current data file being used by the system (e.g. for handling special events or special unpredictable scenarios).

Such a feature can be accessed by selecting “Setup → Temporary destination” (for security reasons the options is under the setup menu which requires the administrative password to be entered).

The screen in Figure 136 is shown for allowing the user to type the destination message to be shown by external LED signs.

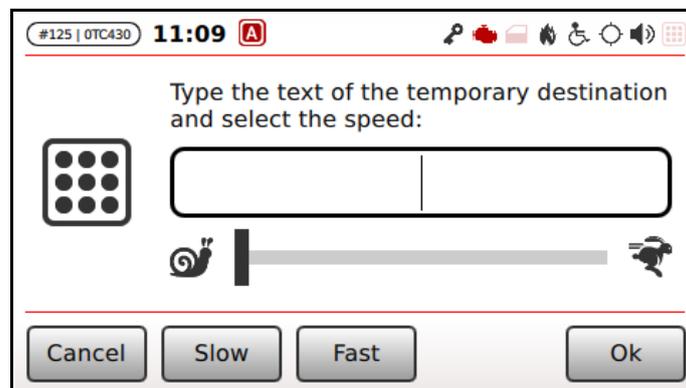


Figure 136: Temporary message typing

The slider shown in Figure 136 sets the animation speed of the text to be shown by LED signs: at its leftmost end the text is published still, while at rightmost end the text is published using the maximum horizontal scroll speed allowed by signs. The slider can be moved by dragging it on the touch-screen or by pressing “Slow” and “Fast” for respectively move it to the left or to the right.

Temporary destination publication is confirmed by pressing “Ok”.

If a temporary destination is being shown by a LED sign, then the text “[TEMP]” appears in the description of LED sign current publication (see paragraph 8.3).

TC-430™ defines a configurable set of words (“dirty words”) which are forbidden to be typed in a temporary destination message. If one of those words is detected in the typed message, the publication is forbidden and the screen reported in Figure 137 is shown.

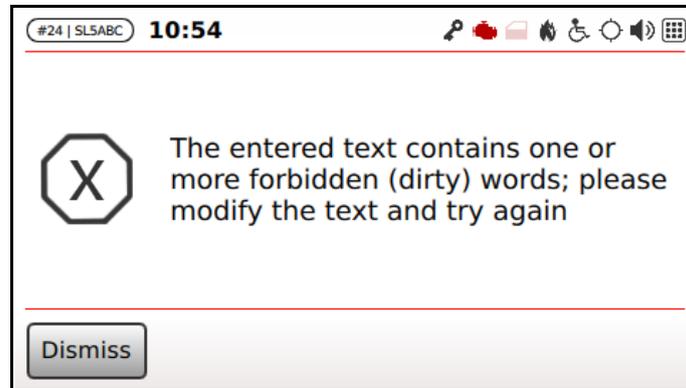


Figure 137: Dirty words detection

The dirty words dictionary can be updated upgrading the TC-430™ software to a version implementing a new dictionary (please refer to Aesys® for obtaining an updated dirty words dictionary suiting specific needs and refer to paragraph 10.1.1 for having directions about software upgrade process).

11.7 HTTP interfaces

TC-430™ provides various web services on the local network both allowing file access (multimedia files) and data access in JSON format. The following table summarizes the available services (Table 6).

HTTP web service are typically exposed on TCP port 8080 (however this parameter can be changed depending on system configuration: refer to Aesys® Customer Service department for further details about this kind of configuration).

URL	Method	Data format	Data format
<i>/system/info</i>	GET	JSON	Information about system (see paragraph 11.7.1 for further details)
<i>/system/data/status</i>	GET	JSON	Information about service data definition currently being run by the system (see paragraph 11.7.2 for further details)
<i>/system/data/upload-vdb</i>	POST or PUT	(raw binary)	VDB upload endpoint; the VDB must be contained in the body (raw binary) of the HTTP POST or PUT request; TC-430™ answers “200 OK” if the upload was successful, or “5xx” if some errors occurred. Note: the maximum size of uploadable VDB file via HTTP interface is set to 16 MB.
<i>/system/data/upload-trx</i>	POST or PUT	(raw binary)	TRX upload endpoint; the TRX must be contained in the body (raw binary) of the HTTP POST or PUT request; TC-430™ answers “200 OK” if the upload was successful, or “5xx” if some errors occurred.

			Note: the maximum size of uploadable TRX file via HTTP interface is set to 16 MB.
<i>/system/data/update-sw</i>	POST or PUT	(raw binary)	Software update endpoint; the software (.tar.gz package) must be contained in the body (raw binary) of the HTTP POST or PUT request; TC-430™ answers “200 OK” is the update was successful, or “5xx” if some errors occurred. Note: the maximum size of uploadable SW updates via HTTP interface is set to 16 MB.
<i>/system/data/update-fw</i>	POST or PUT	(raw binary)	Firmware update endpoint; the firmware (.cyacd bootloadable package) must be contained in the body (raw binary) of the HTTP POST or PUT request; TC-430™ answers “200 OK” is the update was successful, or “5xx” if some errors occurred.
<i>/pis/mme/playlist</i>	GET	JSON	The playlist of contents to be shown for passenger information service
<i>/pis/mme/data</i>	GET	(files)	Assets files referenced by the passenger information service playlist
<i>/multimedia/playlist</i>	GET	JSON	The playlist of multimedia contents to be shown for passenger
<i>/multimedia/data</i>	GET	(files)	Assets files reference by the passenger multimedia playlist
<i>/navigation-data/ext-mis</i>	GET	JSON	Real-time navigation data (see paragraph 11.7.3 for further details)
<i>/screens/config</i>	GET	JSON	LCD screens configuration
<i>/screens/config</i>	POST	JSON	The URL can be used by LCD screens for submitting their diagnostics data
<i>/cms/player/index.html</i>	GET	HTML	The player to be used for CMS content playback
<i>/cms/conditions</i>	GET	JSON	The set of “live” conditions that can be used by the CMS player for argumenting about the contents to be shown
<i>/cms/data</i>	GET	(files)	Assets referenced by the current CMS channel
<i>/cms/status</i>	GET	JSON	The status of the CMS module

Table 6: HTTP interfaces summary

11.7.1 Information about the system

The following data fragment represents the JSON document returned when asking info about the TC-430™ system (<http://<tc-430-ipaddress>:<port>/system/info>).

Every item of the JSON document is commented for documenting its meaning.

```
{
```

```

"board": "Aesys (R) 1504B"           the model/revision of the TC-430™ hardware PCB
"fw-version": "ID 0001, ver..."    the version of the TC-430™ co-processor firmware
"os-version": "Linux tc430..."     the build of the operating system being
                                     run by TC-430™
"sw-version": "1.90.0",             the version of TC-430™ application
}

```

11.7.2 Service data definition format

The following data fragment represents the JSON document returned when asking info about the service data definition currently being used by TC-430™ (<http://<tc-430-ipaddress>:<port>/system/data/status>).

Every item of the JSON document is commented for documenting its meaning.

```

{
  "format": "vdb",                   the format of the service data definition file being
                                     used by the TC-430™ (it can be none, trx or
                                     vdb)
  "level": 90,                       the current service data definition; -1 if the level
                                     is not available (e.g. for TRX files or no files)
  "unit-profile": "0TC430"           the code of the unit profile configured within
                                     the current service data definition file, if any; an
                                     empty string if not available (e.g. for TRX files or
                                     no files)
}

```

11.7.3 Navigation data format (EXT-MIS format)

The following data fragment represents the JSON document returned when asking navigation data to the TC-430™ using the HTTP interface returning them in EXT-MIS format (<http://<tc-430-ipaddress>:<port>/navigation-data/ext-mis>).

Every item of the JSON document is commented for documenting its meaning.

```

{
  "dt": "08/06/2017 15:33:04",      date and time
  "extra": {                          (reserved for future usage)
    },
  "id": 0,                             id that is incremented whenever
                                     navigation data change
  "position": {
    "avis": -1,                        (reserved for future usage)
    "dl": -1,                          current time profile of the bus, expressed in
                                     seconds (delay if greater than zero, advances if

```

<pre> "dr": 0, "dttd": 10166, "lost": 0, "nsi": 2, "pos": "bs", "speed": 13.478, "ttd": 308, "tts": 28, "stop_req": 1 "wheelchair_req": 0 "type": "PS", "ver": 3 }, "stops_list": { "stops": [{ "id": "000LV1", "ix": 11, "nm1": "Frejus - Stop 1", "nm2": "Stop 1" }, { "id": "000LV2", "ix": 12, "nm1": "Frejus - Stop 2", "nm2": "Stop 2" }] } </pre>	<p>less than zero)</p> <p>doors status, 0 when closed, 1 when opened</p> <p>distance in meters to destination</p> <p>lost flag: 0 when on-track, 1 when off-track</p> <p>next stop index (-1 when it's unknown)</p> <p>bus position in relation to the current stop bs: before stop area as: area stop (position is inside the stop area) (empty string when it's unknown)</p> <p>bus average speed (meters/seconds) (the average is reset at every stop change) (-1 when it's unknown)</p> <p>time in seconds to destination (estimate) (-1 when it's unknown)</p> <p>time in seconds to next stop (-1 when it's unknown)</p> <p>stop request (0=not active, 1=active)</p> <p>wheelchair stop request (when stop request is 1, tells whether the stop was requested for wheelchairs (1) or not (0)</p> <p>type of the data structure (info about the bus position along the active track)</p> <p>version of the data structure</p> <p>stop unique code ID</p> <p>stop progressive index long the current track</p> <p>stop name in first language</p> <p>stop name in second language</p>
--	--

<pre> "id": "000LV3", "ix": 13, "nm1": "Frejus - Stop 3", "nm2": "Stop 3" }, { "id": "000LVN", "ix": 16, "nm1": "Frejus - Stop N", "nm2": "Stop N" }], "type": "ST", "ver": 1 }, "trip_info": { "dest1": "", "dest2": "", "line": "000LV1", "type": "CI", "ver": 1 } } </pre>	<p>type of the data structure (info about the stops list)</p> <p>version of the data structure</p> <p>trip final destination in first language</p> <p>trip final destination in second language</p> <p>the active bus line</p> <p>type of the data structure (info about the trip)</p> <p>version of the data structure</p>
---	---

11.8 System reboot

TC-430™ can be simply rebooted by selecting “Menu → Reboot” (Figure 138).

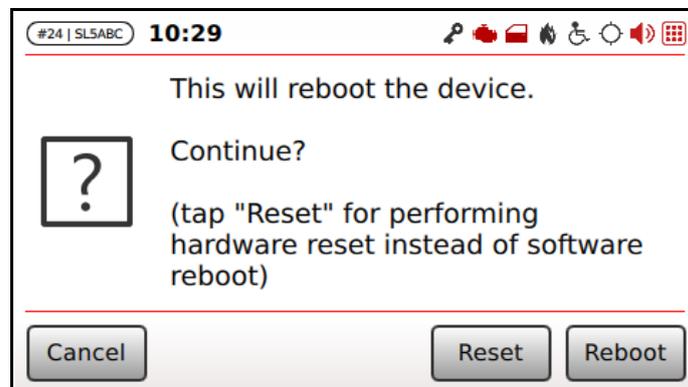


Figure 138: Device reboot

“Reboot” will cause the operating system of TC-430™ to be rebooted (software-reset) while “Reset” will cause the system to be hardware-reset.

12. References

- [1] “Aesys® Verba 2014™ User Guide”, Aesys S.p.A. 2006 – 2018
- [2] “Aesys® KC-2S-U protocol version 1.0.0”, Aesys S.p.A. 2016 – 2018
- [3] “Aesys® HAL™ User Guide”, Aesys S.p.A. 2006 – 2018