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APR600
User Manual

Firmware v1.02 and higher

V24/03/21

TB

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Content

1 Introduction

The APR600 is a high quality, ruggedized portable RFID reader for tags complying with the ISO11784 / 11785 standard. It can read *EID* tags with FDX-B and HDX technology. In addition to the reading functions, the device can store up to 1.000.000 records in several groups in the large internal memory. Each record also contains a timestamp plus a Visual ID and an *Alert*, if available. The data are transmitted via the several available interfaces (USB, Bluetooth and WLAN) directly after reading.

The APR600 also supports the *Task-Mode* and the ***D**ata**B**ase**F**unction* (*DBF*) if the appropriate definitions or data have been uploaded. This is usually done by 3rd-party Management Software.

The reader has a large color display which can show many information at one glance. Together with the 19 keys it allows the easy and convenient navigation through menus and data. In addition, the device has status LEDs above the display for indicating charging- and interface status plus the reading status. The integrated speaker provides acoustical feedback to the user and the vibrating motor is very useful in noisy environments.

2 Before you start

The internal Lithium-Polymer battery should be fully charged before the first use. The battery can be charged by using the provided Magnetic-USB cable and any USB power source. Note that computers can usually not supply more than 500mA on USB ports, hence charging the APR600 over a USB port of a computer takes longer than charging it from the Agrident USB power supply.

The internal fast charging takes about 4 hours maximum in case the battery was empty completely when using the Agrident USB power supply. Note that the battery will only be charged within a temperature range of 0°C to 45°C (+32 to 113°F).

3 Reader Hardware

This chapter describes the APR600 hardware including all accessories.

3.1 Parts of the APR600

The dimensions of the APR600 are 190x98x40 millimeters and it has a weight of only 280 grams. It provides a good reading performance, a large 2.4-inch color TFT display, two status LEDs above the display, a speaker and a vibrating motor. The reader can be controlled with seven ergonomic keys below the display. In addition, there are 12 alphanumeric keys for entering data.

The APR600 is using a 3.7V Lithium-Polymer battery with a capacity of 3.400mAh. It is not replaceable in the field. The battery can be exchanged by authorized technical staff only in case it has reached its end of life.

3.2 Accessories

The APR600 comes with a USB-A to Magnetic-Connector cable.

The USB-A plug can be connected to any USB-port of a computer. Note that the appropriate USB driver must be installed first. When it is necessary to use a USB extension, this should only be high quality cable and it should not be longer than two meters. The maximum cable length for USB is five meters and this can already lead to problems in practice (slower charging or USB failures).

In addition, the APR600 Kit contains the transport box '*ATB400*', an USB power supply '*APS500*' for charging the reader from the mains and the car charger '*ACC500*' that allows to charge the device from a cigarette lighter socket.

APS500 (p/n 3020)

ACC500 (p/n 4043)

Transport box ‚*ATB400*' (p/n 4067)

3.3 Connecting the USB cable

The APR600 uses a Magnetic-USB connector. Because the magnets are polarized, the connectors 'find' the correct orientation almost automatically. When the magnetic connector of the cable is moved towards the plug at the bottom of the reader (1), the magnets will attract each other in the correct orientation (2). In the wrong orientation, the magnets will repel each other.

Do not try to force a connection when the connector is in the wrong orientation – this might damage the reader and voids the warranty.

For disconnecting USB, just pull the cable away from the device (3).

4 Controlling the APR600

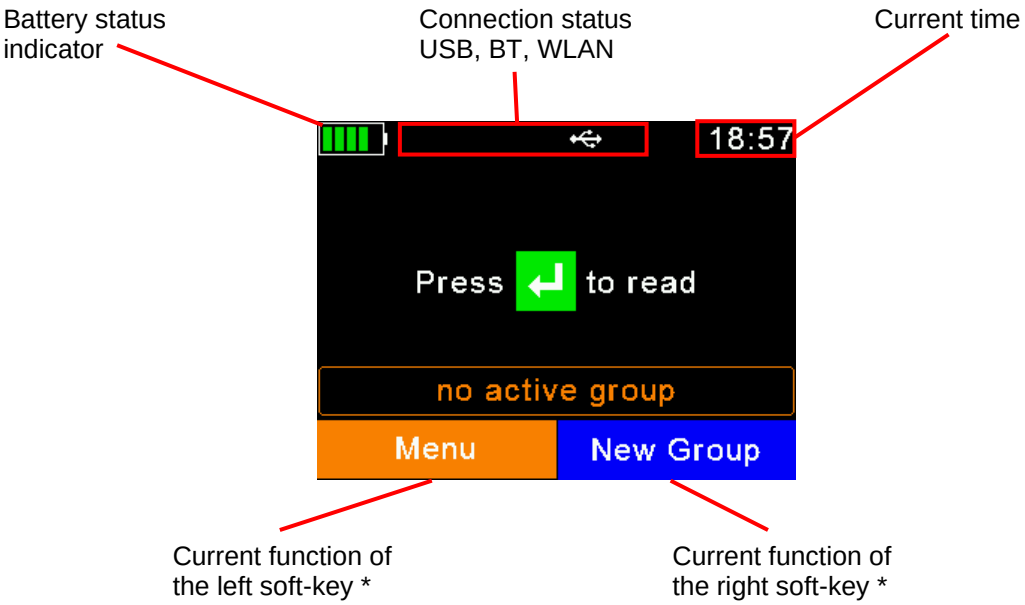
The APR600 has a large color display and 19 keys which are used for controlling the device.

The Reader is activated by pressing the ↵ key in the middle of the directional pad.

4.1 APR600 Display

4.1.1 Home Screen

After the reader is switched on, the following home screen appears:



* A 'Softkey' is a key that performs different functions depending on the associated screen display.

The battery status indicator shows the approximate battery level. In this example the battery is fully charged. It would also display possible faults concerning the battery in case charging is not possible.

In the screenshot above, the only active connection is USB. The reader would also indicate a Bluetooth or WLAN connection in this area.

The soft keys have different meanings depending on the current operation. In the home screen, the left soft key is used for entering the menu and the right one for creating a new group separator.

The '*new group*' function is only the default action triggered by pressing the right soft key. Other '*quick menus*' might be configured and uploaded to the reader from the PC and the action to be started can be changed on the reader by long pressing the right soft key.

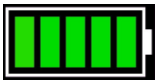
4.1.2 The status symbols at the top of the display

There is a status bar in the first display line. Beside the time (on the right side) it provides information about the battery status and the different interfaces.

The blue symbol is for WLAN and the orange one for Bluetooth. The color of the symbols depends on the current connection status.

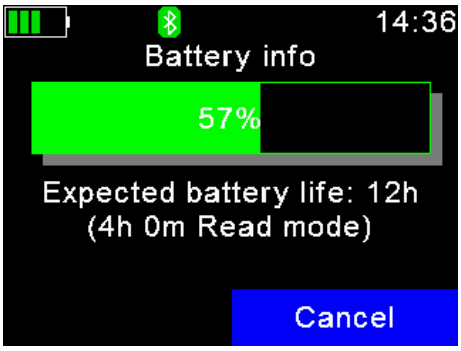
4.1.2.1 Battery status

The battery symbol on the left side indicates the approximate remaining battery capacity.

Status	Meaning
	Battery capacity is higher than 80 percent.
	Capacity is between 60 and 80 percent.
	Capacity is between 40 and 60 percent.
	Capacity is between 20 and 40 percent (no charger connected -> discharging)
	Capacity is between 10 and 20 percent (no charger connected -> discharging) When flashing, capacity is lower than 11 percent.
	Capacity is between 20 and 40 percent (only green when charging).
	Capacity is between 10 and 20 percent (only green when charging).
	General charging error. There is a condition that prevents charging. Check the external power supply. If this error is shown repeatedly, the battery might not work correctly any longer and should be replaced. This error also occurs, when the battery should be charged outside the allowed temperature range of 0°C to 45°C.

During charging the battery symbol is constantly filling from the point of the remaining capacity. Charging is complete if no bars are flashing anymore. The charger can be disconnected in this case.

The menu item '*Show Battery Info*' in the '*Setup*' menu (chapter 7.7.5.1) shows an estimate of the remaining battery capacity in percent as well as the estimated remaining operating time in idle mode and in continuous read mode.



Navigation from the home screen:

4.1.2.2 WLAN status

Status	Meaning
	WLAN is switched on but not connected to an Access Point.
	Connected to an Access Point and waiting for connection (listening).
	Connection is established (TCP or UDP – port is open)
	WLAN init: This symbol is displayed when the WLAN module is currently booting, being configured or a Firmware update is in progress.

4.1.2.3 Bluetooth status

Status	Meaning
	Slave Mode – APR600 can be connected from other devices
	Master Mode – APR600 is trying to connect to remote device
	Connected (in either Bluetooth Mode)
	Bluetooth init: This symbol is displayed when the Bluetooth module is currently booting, being configured or a Firmware update is in progress.

4.1.2.4 USB status

The USB status is shown in the middle at the top of the display:

When the APR600 is connected to the USB port of a computer or to a standard USB power supply, the white USB symbol is shown. Charging the battery takes longer here compared to using the Agrident USB power supply.

In case the APR600 is connected to an Agrident USB power supply, the symbol changes from white to red. In this case fast charging will be used.

4.2 The status LEDs above the display

The APR600 has two status LEDs above the display.

The left LED is a multicolor type and is used for multiple purposes. When the display is switched off, it indicates the charging status of the battery. During the activation of the RFID engine it shows the reading status.

The LED on the right is blue and it is used for indicating the connection status with the display switched off.

The RGB LED on the left side indicates the charging status of the battery pack with the display switched off:

Color	Interval	Meaning
	Flashing, every second for 10ms	Battery is being charged
	Solid	Battery is fully charged

The multicolor LEDs are only used when the APR600 is in *Suspend-Mode* (display is switched off but the device is connected to USB and hence is being charged). When switched on, the battery symbol in the display indicates the charging status.

With activated RFID engine, the multicolor LED shows the reading status as follows:

Color	Interval	Meaning
	Flashing slowly	RF is activated, ready to scan tags
	Flashing fast	Tag has been read the first time (new tag)
	Flashing fast *	Same tag has been read repeatedly *

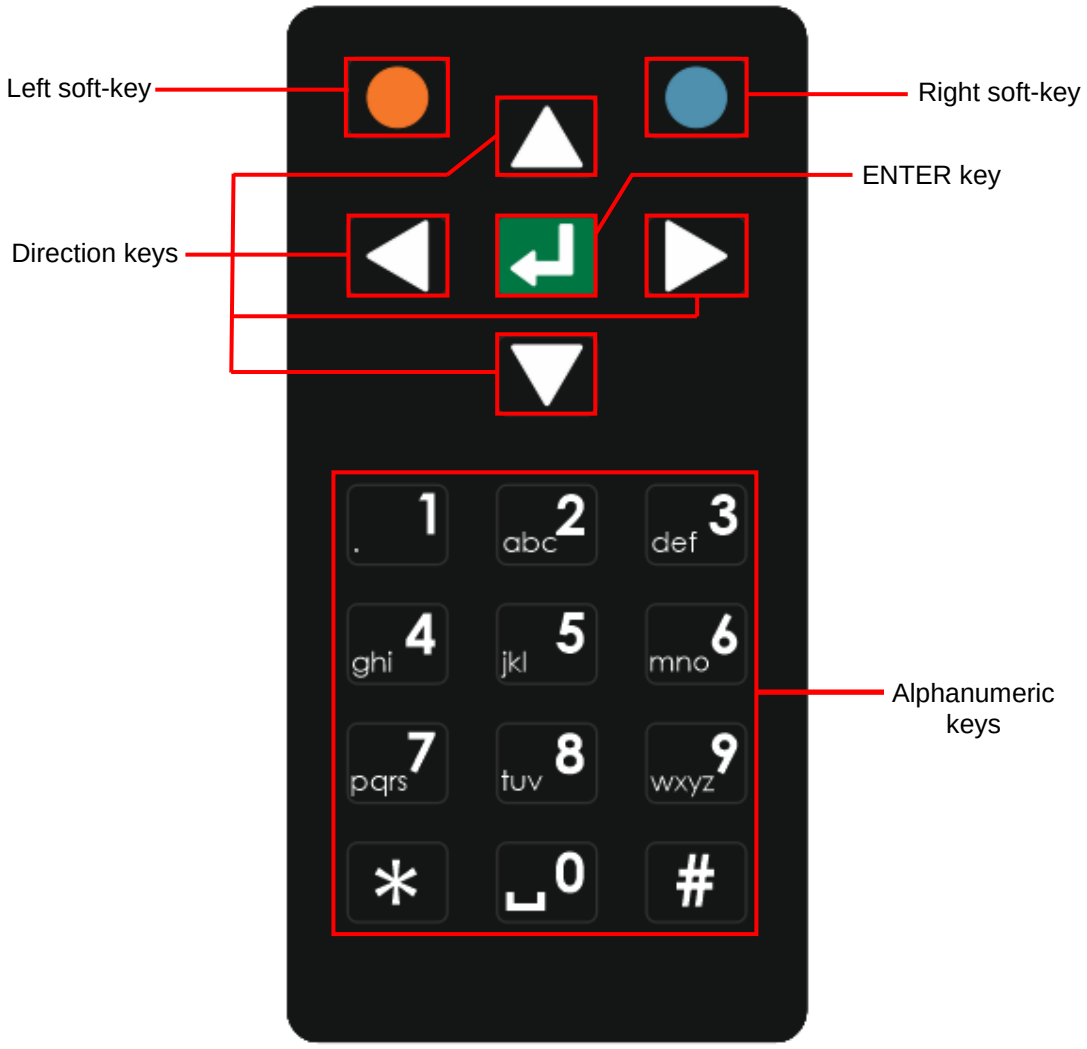
* only for continuous reading mode and with activated animal counter (see chapters 7.7.1.2 and 7.7.1.1)

The blue LED on the right side is only used when the display is turned off. Then it indicates the following operating modes:

Color	Interval	Meaning
	Flashing every 3 seconds	APR600 is in *SD-Card-Mode* (MSC)
	Flashing once a second	APR600 is in *Suspend-Mode* (CDC)

4.3 Using the keyboard

The APR600 has 19 keys to allow the easy and convenient operation of the reader. There is a directional pad with an ENTER key in the middle and there are two additional soft-keys below the display which change their function depending on the current action. For entering data fast and easy, the reader provides 12 alphanumeric keys.



Key	Operation
	Enters the menu in the home screen. Moves up one menu level (‘Back’), other functions depend on current operation – the current function is always displayed on the left side in the last display line (above the key).
	When in the home screen, the configured ‘quick action’ will be executed. Exits the menu completely and moves back to the home screen. Other functions depending on the actual operation are shown in the display on the lower right side.
	Switches on the APR600. Starts a reading attempt from the home screen. Enters menu items and confirms selections there. Moves to the next field in *Task-Mode*.
	No function in home screen *
	Switches off the APR600 on a long press (>2 seconds) *
	No function in home screen *
	No function in home screen *

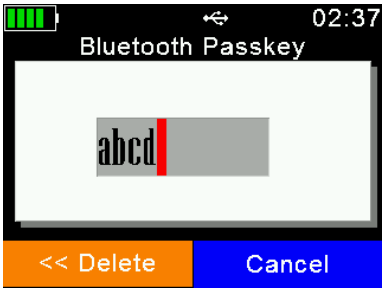
* The directional keys are also used to navigate within menus (up, down, left and right), for scrolling through *DataBase* fields and selection lists and for selecting characters in numeric or text input fields.

The alphanumeric keys are mainly used for entering data in text or numeric fields.

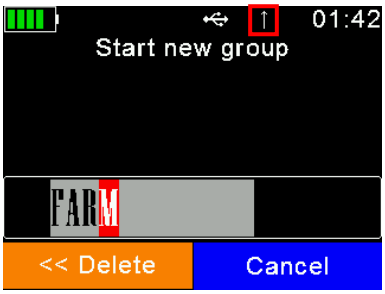
Alphanumeric entries:

- The keys [1], [2], … [0] serve multiple functions.
- The first press on a key selects the large imprinted character, e.g. '*1*' or '*2*'.
- When the same key is pressed again within one second, the first small imprinted character will be selected in lower case, e.g. '*a*' or '*d*'.
- Another keystroke of the same key within one second selects the next imprinted character.
- When the last character is selected, another keystroke will select the first (large) imprinted character again.
- If the key is not pressed again (within one second), the last selected character is entered.
- In case a different key is pressed, the selection of the previously pressed key is ended and the last selected character is entered.
- For text inputs, the [*] key is used as Caps Lock – one can switch between lower- and upper-case letters.
- Within lists it is possible to move to the last entry in the list via [#] and to the first entry by pressing [*] – the same applies to minimum and maximum values in the menus for the reader settings.

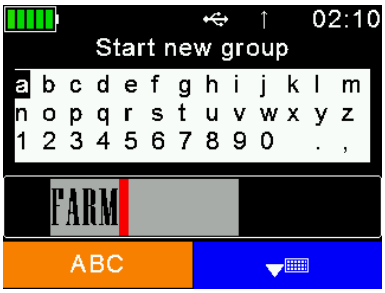
The following examples show some more details on the keyboard usage:



Beside the usage of the alphanumeric keys, it is possible to change the character of the currently selected position using the ▲ or ▼ button for simple text input fields.

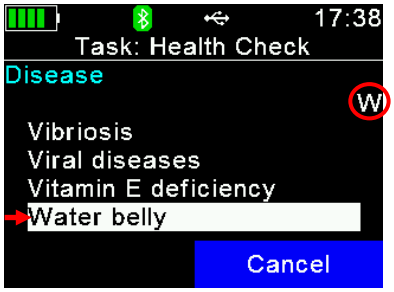


This is an extended text input field which starts a new group. The ↑ symbol in the status line indicates that the Caps Lock is activated (the [*] key was pressed). Hence all letters are directly entered as capitals. When [*] is pressed again, lower case letters will be used.



It is also possible to activate a virtual keyboard for extended text input fields. This can be done by pressing ▲ or ▼. The ● key switches between lower case letters, capitals and numbers (plus special characters). The virtual keyboard can be closed by pressing ●. When an alphanumeric key is pressed while the virtual keyboard is open, it will be closed right away.

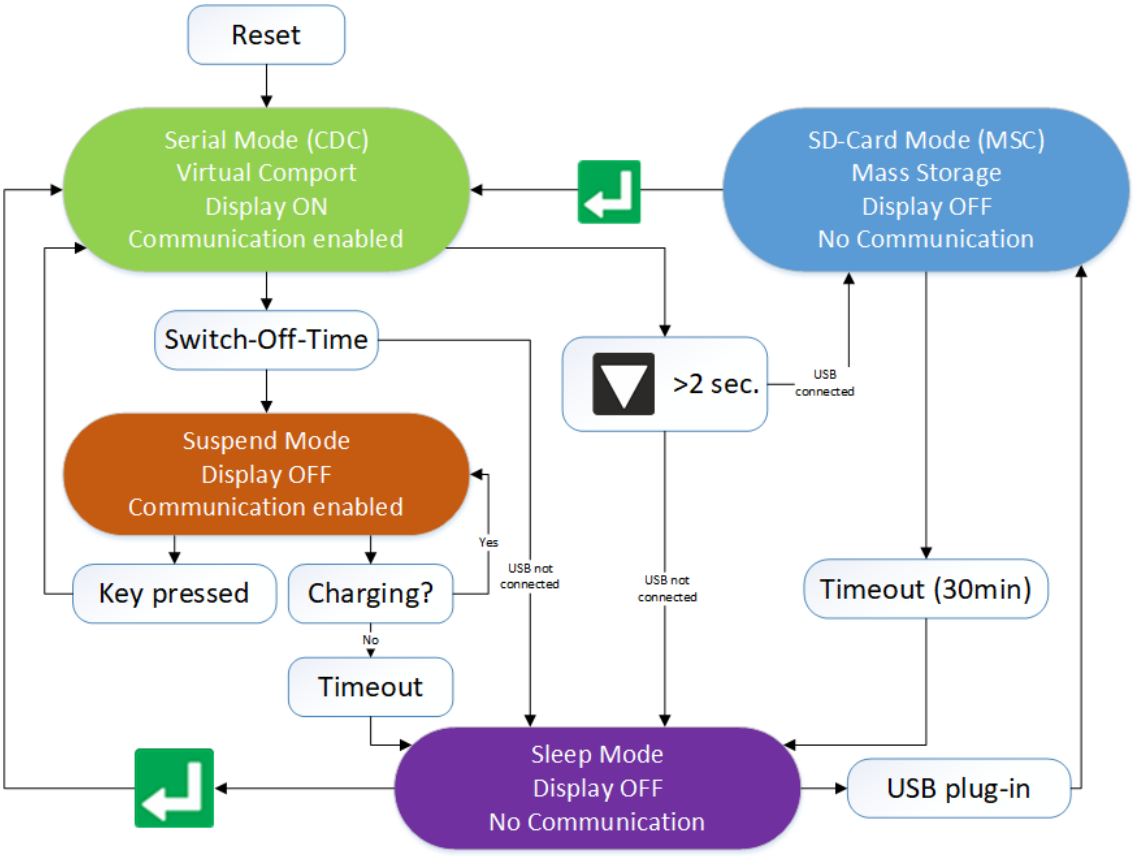
When using numeric input fields one can change the number of the currently selected position by using the ▲ or ▼ key. In addition, the numeric buttons can be used. For number input fields, the (alpha)numeric keys do not have multiple functions. When pressing a numeric key, the number is directly entered and the cursor moves to the next digit. Letters are not selectable here. This speeds up the input.



When using selection lists in *Task-Mode* or ***D**ata-**B**ase-**F**unction*, it is possible to enter the initial letter. This allows to switch to the next entry that starts with that letter. Therefore, one should press the alphanumeric key repeatedly until the desired letter appears on the upper right side. If no key is pressed within the next second, the reader assumes that this is the selected initial letter and starts searching. When a search letter has been entered, one can switch between the available matches in the list using the ◀ / ▶ keys.

5 Operating states

The APR600 has several operating states concerning display status and communication possibilities over USB. The following chart shows the different states.

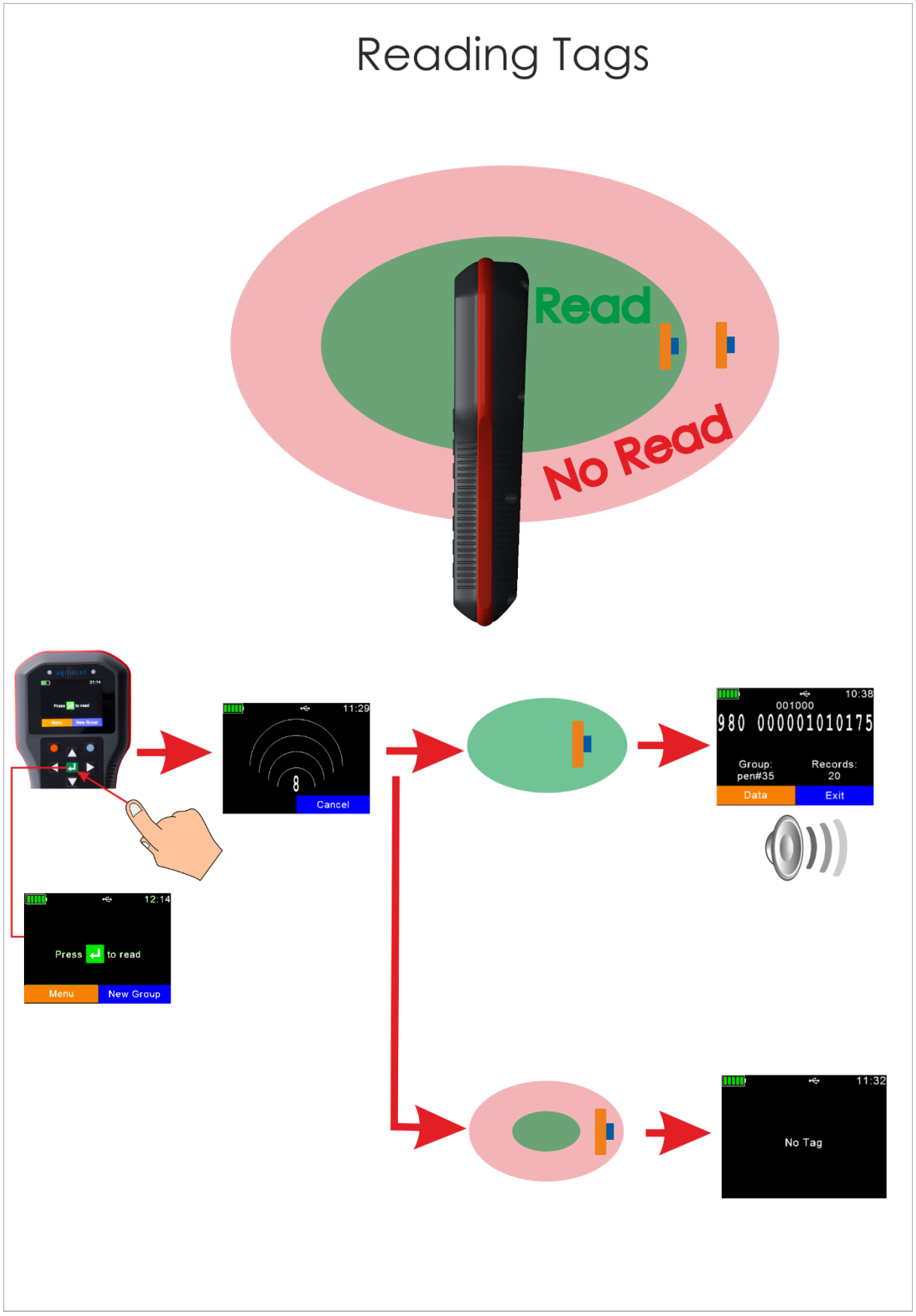


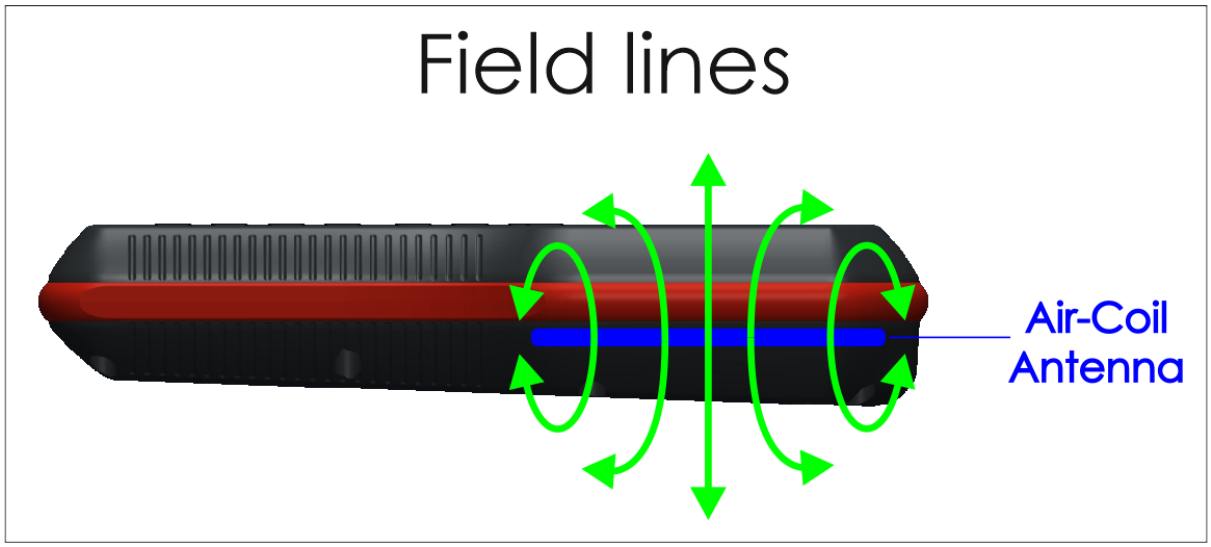
When the reader is switched on and it is connected via USB, it works in *CDC-Mode*. That means a virtual comport is created on the computer and it is possible to send commands to the device via a serial port connection. In this state the mass storage mode is not activated, it is not possible to copy files to or from the APR600.

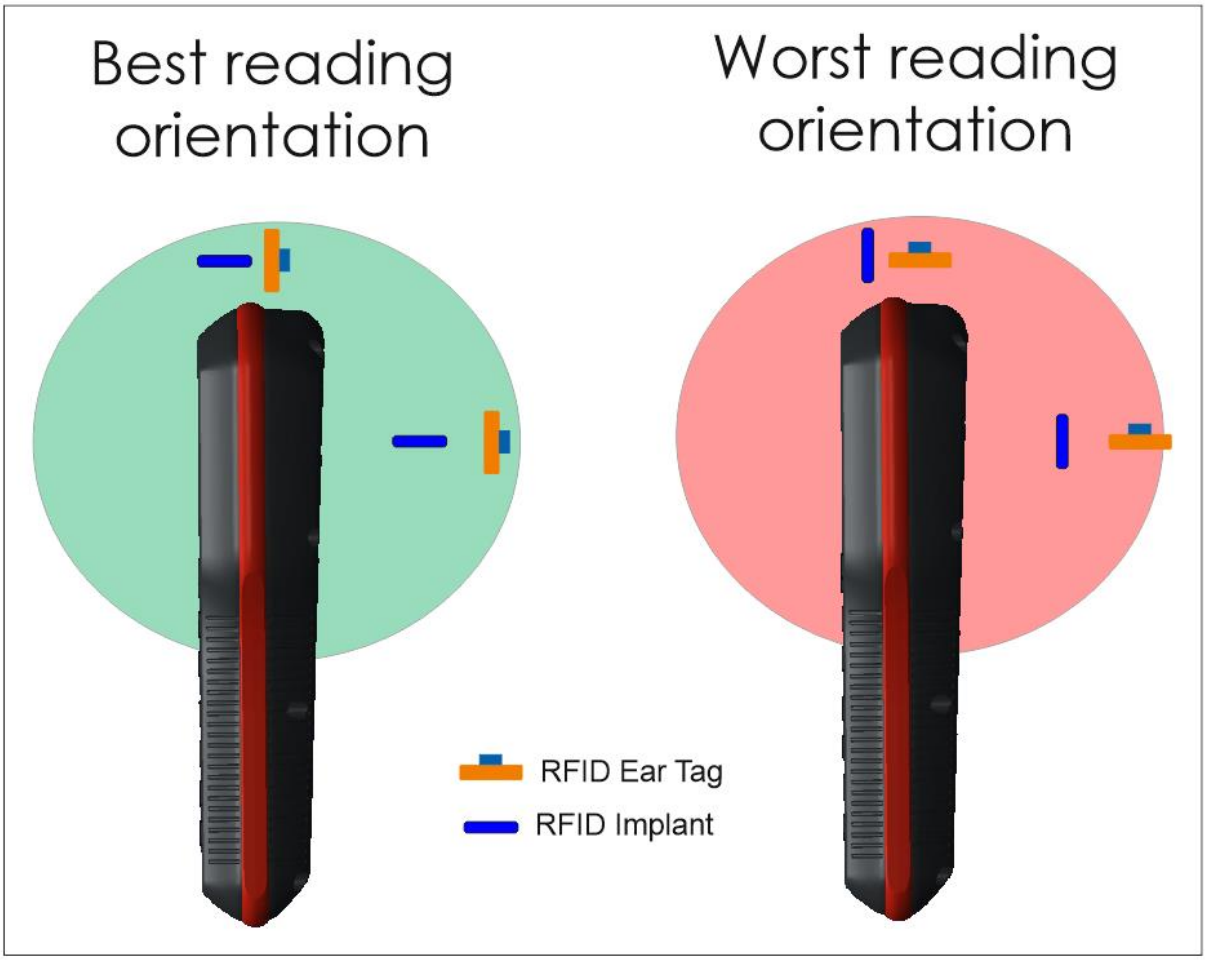
After the configurable switch-off-time (default = 60 seconds) has elapsed, the reader enters *Suspend-Mode* when a USB cable is connected. The display is switched off but communication is still possible. In this state the blue LED on the right above the display is flashing in cycles of one second. The device will not enter sleep mode as long as USB is connected and the battery is still charging. The red LED flashes in intervals of one second, indicating that the battery is being charged. After the battery has been charged completely, the reader enters sleep mode after a timeout of 60 seconds.

If the APR600 is connected to USB while it is switched off, the MSC mode is activated. Then the reader is attached to the computer as a mass storage device and file transfer is possible. Once the ↵ key is pressed, the device will switch on and use *CDC-Mode* right away. When pressing ▼ for at least two seconds while USB is connected, the APR600 will enter *SD-Card Mode* as well.

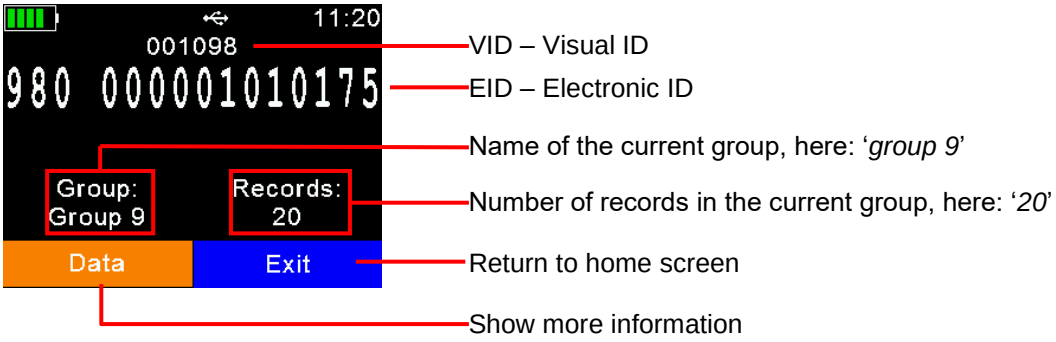
6 Reading Tags



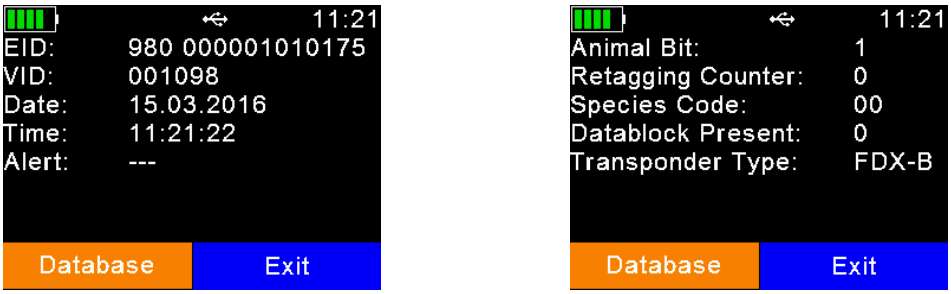

Field lines
Air-Coil
Antenna


Best reading
orientation
Worst reading
orientation
RFID Ear Tag
RFID Implant

After a tag has been read, the display will show the information as in the following screenshot:

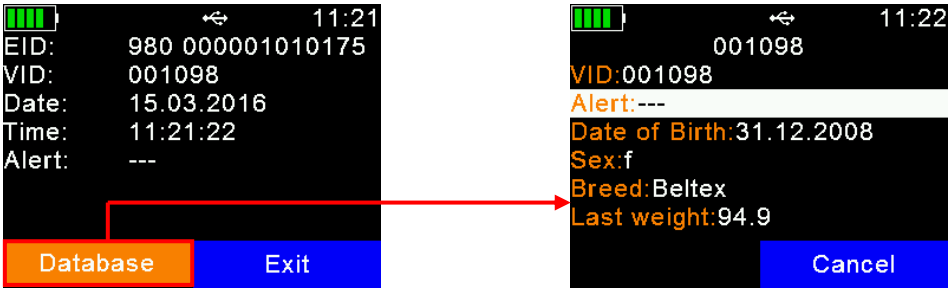


If '*Data*' was pressed, the screen on the left side is shown. It provides information about the *EID*, *VID* (if available), Date and Time of reading and the *Alert* text (if there is one for this tag).



If ▼ or ▲ is pressed, the screen on the right side is shown. It indicates the tag type (FDX or HDX) and displays the so called 'advanced ISO information'. You can move from one screen to the other by pressing any of these keys.

If a *DataBase*-Record is available for this tag, you have the option to view the *DataBase* information by pressing the left soft key here as shown in the left screenshot.

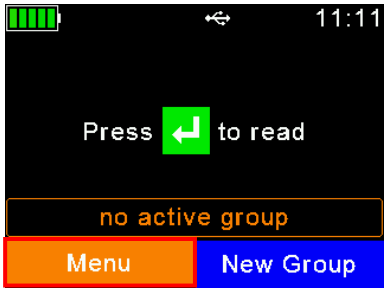


The right picture shows the *DataBase* entries. The fields depend on the definition of the *DataBase*. You may also edit fields by selecting them and pressing ↵ if they are allowed to be editable in the *DataBase* definition. All other fields are not selectable at all.

If an *Alert* is present for the tag just read, the *Alert* text is displayed continuously inverting and an *Alert* sound is played. The *Alert* can be disarmed (don't shown again after next reading of this tag) or it can be just skipped.

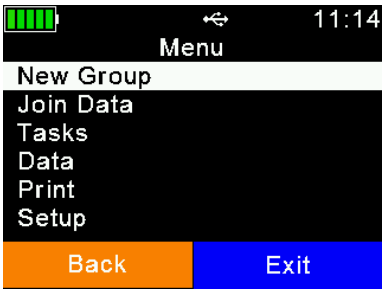
The *Alert* can be 'disarmed' and would then not be shown again if the tag is read the next time. When selecting '*Skip*', the *Alert* remains activated.

7 Menu items



To enter the APR600 menu, press ● while in the home screen. In the lower left corner of the display you can also see the information that a press of the left soft key will force the device to enter the menu.

This screenshot shows the highest menu level. It contains the items '*New Group*', 'Join *Data*', '*Data*', '*Print*' and '*Setup*'. If another language than the default one has been selected, the menu items will look different.



The entry '*Tasks*' does only appear, if Tasks have been uploaded to the device – otherwise this item will be hidden. The *Task-Mode* is another operating mode of the APR600 that allows the collection of comprehensive data. For further information about this operating mode contact your local distributor.

For the navigation through the APR600 menus, all seven keys might be used. The directional keys have the following functions here:

Key	Operation
	Enters the next submenu or performs specific actions in the lowest menu level
	Moves up one menu item
	Moves down one item
	Jumps to first entry in the current menu
	Jumps to last item in the actual list

With exception of the lowest menu levels, the left (orange) soft key will force the device to move one menu level upwards and the right one (blue) will let the reader return to the home screen. In the lowest submenu the right soft key will cancel the action.

7.1 Menu structure

The following table shows the menu structure of the APR600 including submenus and options. Options or actions are shown in *italic* and the default values for options are marked with ' * '.

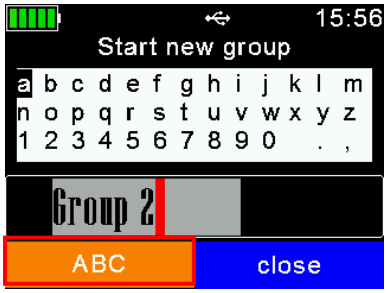
Main Menu	*1st sub menu*	*2nd submenu*	*3rd submenu*	*4th submenu*
New Group	*Start new group*			
Join Data	*EID + VID*			
	EID + Weight			
Tasks	*New Task Entry*			
	Show Memory Info			
	Choose Another Task			
Data	Show Data	*Select Group To Show*		
	Set Active Group			
	Clear Data	Clear Groups	*Select Group*	
			Clear All Groups	
		Clear Task Data	*Select Task*	
			Clear All Task Data	
	Memory Info			
	Search DB by VID			
	Search DB by EID			
Print	*Print Active Group*			
	Select Group			
	Print All Groups			
	Print Barcode			
	Setup Printer	Set Printer Type	*1 - Generic Line Printer*	
			*2- Able Systems AP 1300 **	
			3 - Extech APEX 2	
			4 - Extech APEX 3	
			5 - Extech APEX 4	
			6 - Zebra QL220	
			7 - Zebra QL320	
			8 - Zebra QL420	
			9 - Zebra QLn220	
			10 - Zebra QLn320	
			11 - Zebra QLn420	
			12 - Martel MCP 1880/7880	
			13 - MTP-3	
		Search BT printer		
Setup	Reader Settings	Animal Counter On/Off	*Animal Counter ON*	
			*Animal Counter OFF **	
		Set Read Mode	*Single Read **	
			Continuous Read	
			Auto	
		Set Online Mode	Online Mode On/off	*Online Mode ON **
				Online Mode OFF
			Set Output Format	*ASCII*
				Byte Structure
				Compact Coding
				Custom Format
				ISO24631
				NLIS
				Raw data
				*Short ASCII 15 **
				Short ASCII 16
				ASCII + SCP
			Read If Connected	*Read always **
				If buffer not full
		Wireless Sync On/Off	*Wireless Sync. ON*	
			*No Sync. **	

Main Menu	*1st sub menu*	*2nd submenu*	*3rd submenu*	*4th submenu*
Setup	Reader Settings	Volume & Vibrator	Set Volume	*0% (OFF)*
				20%
				40%
				*60% **
				80%
				100%
			Vibrator On/Off	*Vibrator ON **
				Vibrator OFF
	Display	Set Date/Time	[set values manually]	
		Set Switch Off Time	*60 min*	
			30 min	
			20 min	
			10 min	
			5 min	
			3 min	
			2 min	
			90 sec	
			*60 sec **	
			30 sec	
			20 sec	
			10 sec	
			5 sec	
		Set Display Colors	*Black **	
			White	
		Set language	[depends on uploaded languages]	
	Interface Setup	Setup Scale	Set Scale Type	*1 - Tell **
				2 - Iconix FX15
				3 - TruTest
				4 - BWT BW(S) & JD-II
				5 - Gallagher
				6 - Dini Argeo DFWLB
				7 - Te Pari Scale
		Setup Printer	[same as setup printer on the previous page]	
		Bluetooth	Set Bluetooth Mode	*Master Mode*
				Slave Mode
				*Bluetooth OFF **
			Start BT Inquiry	
			BT Device History	
			Set BT Profile	*SPP **
				iAP
				HID
				HID Smart
				BLE
			Set BT Passkey	[default = '*1234*']
			Show Bluetooth Info	
		WLAN	Set WLAN Mode	*Station*
				Access Point
				*WLAN OFF **
			Set WLAN Protocol	*UDP **
				TCP Server
				TCP Client
			Show Access Points	
			Show WLAN Info	
	Configuration	*Set Factory Configuration*		
	Device Info	*Show Battery Info*		
		Show Firmware Info		
		Show Hardware Info		
		Noise Monitor		
		Timing Monitor		

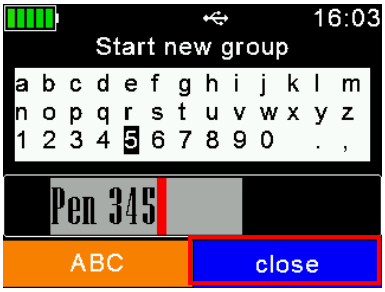
7.2 New Group

In the memory of the APR600, records are organized in groups. One group can contain up to 10.000 records maximum. A new record is created for every tag which has been read. If you do not wish to create new records for duplicate reads, enable the '*Animal Counter*' – then duplicates will not be saved again within one group (see chapter 7.7.1.1).

After '*New Group*' was selected, the user will be prompted to insert a group name. At this stage the suggested name can be accepted by pressing ↵ or it can be deleted by pressing the left soft key character by character. A long press removes all digits in one step. By pressing ▲ or ▼ the device will open a soft keyboard which is shown in the display. The alphanumeric keys can be used as well for entering a group name.



The user can navigate to letters, numbers or symbols and paste the desired character into the group name by using the ↵ key. By pressing the left soft key, the keyboard content can be switched (capitals & special characters).



After the new group name has been entered completely, press the right soft key (here: '*close*') to exit the virtual keyboard. Now the name can be checked again and it will be confirmed by pressing ↵. All tags read from now on will be saved in this group (max. 10.000).

After 10.000 records within one group the device will force the user to create a new group – even if groups are not required for a particular application. But this only means the press of one key in the simplest case (confirm suggested group name by pressing ↵).

If no group has been created manually before the first tag was read, the device will insert a group with the default name '*Group 1*' automatically. If the name of the first group should be different, the user must insert a group **before** scanning for tags.

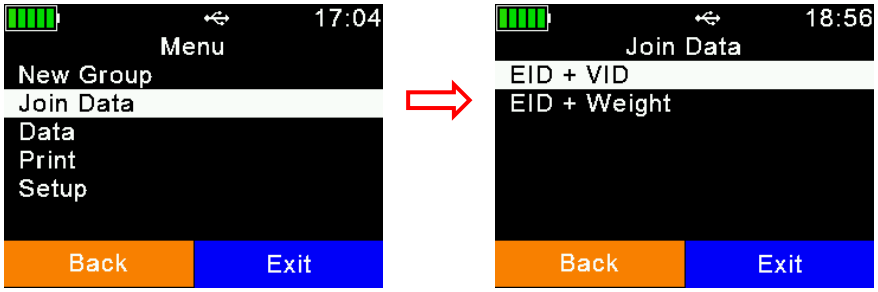
7.3 Join Data

Join Data expands the functionality of the Classic Mode to include the ability to link additional data with the *EID* on the device.

Two different *Join Data* functions are available for the APR600:

- *EID* + *VID* for linking a Visual ID to a tag
- *EID* + *Weight* for joining the Weight from an electronic scale with the *EID*

The *Join Data* menu is accessible via the second entry in the main menu:



7.3.1 *EID + VID*

EID + *VID* is used to allow the operator to assign the read tag to a ***V**isual **ID*** on the device. There are two different ways for selecting the *VID* to assign:

- Entering the *VID* with the keyboard
- Selecting a 'free *VID*' from the *Link-List*

The *EID-VID* pairs are written to the readers *Link-List* and in addition, records will be saved in the currently selected group.

7.3.2 *EID* + Weight

This function allows to link the weight of an animal (received from an electronic weighing indicator) to the *EID*. The list of supported scales can be found in list of the menu structure (chapter 7.1). Ensure that the scale settings are made correctly before trying to use this feature. The weight is saved as a record in the active group together with the *EID*.

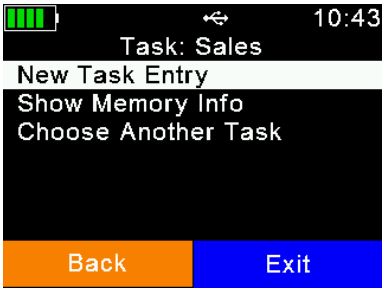
Refer to the separate *Join Data* manual for mobile readers concerning all details for these additional functions.

The data collected via the *Join Data* function can be downloaded with *AgriLink* or any 3rd party software that supports the required operations.

7.4 Tasks

This submenu is only visible if Task-Definitions have been uploaded. Such definitions are usually very much dependent on the application and thus Agrident cannot provide them. They are normally created by distributors who also offer Management-Software that supports Agrident mobile readers. If no Task-Definitions have been uploaded, this menu item will not be shown at all. Contact your local distributor for further details about *Task-Mode*.

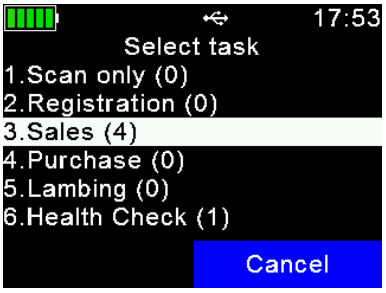
If Task-Definitions are present on the APR600, this menu item will be visible automatically. When entering the submenu '*Tasks*', the following entries are shown:



New Task Entry: Create a new record for the currently selected Task

Show Memory Info: Shows the amount of records for the currently selected Task and the number of possible remaining records (maximum 10.000 per Task)

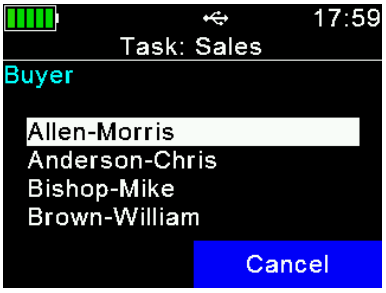
Choose another Task: Select a different Task definition



If '*Choose Another Task*' was selected, the reader is listing all available Tasks plus the amount of records in brackets for each Task.

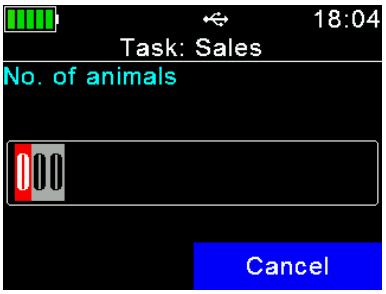
Navigate to the desired Task by using the ▲ / ▼ keys and select the Task to use by pressing ↵.

A new Task is started via '*New Task Entry*'. Basically, the user can switch from one data field to the next one by simply pressing ↵ after the correct data have been inserted. The method for inserting data depends on the field types which are used in the Task-Definition. This manual will just show some examples. For further details contact your distributor, who provided the Task-Definitions.



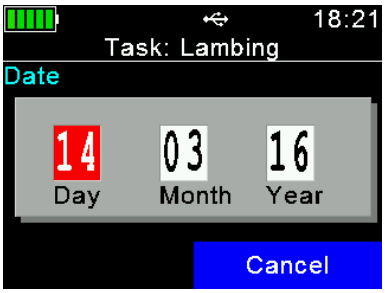
This is a List-Field.

▼ … One item down
▲ … One item up
▶ … Next page
◀ … Previous page
↵ … Select item



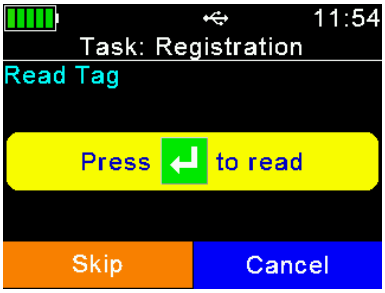
Here is a Numeric-Input-Field.

▲ … Increase number
▼ … Decrease number
▶ … Next digit
◀ … Previous Digit
↵ … Confirm input



That is a Date-Field. The device suggests the current date but the user has the chance to edit it.

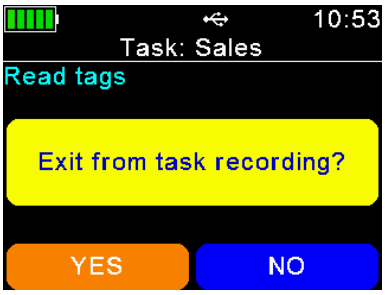
▲ … Increase number
▼ … Decrease number
▶ … Next field
◀ … Previous field
↵ … Confirm input



When this field is shown, the APR600 will start scanning for a tag after ↵ has been pressed.

After a tag has been read successfully, the display will show the *EID* and ask for a confirmation. By pressing '*OK*' (left soft key) the *EID* will be stored and the Task is continued. If the *EID* was the wrong one it can be deleted by pressing the right soft key ('*DELETE*') and the reading process can be started again.

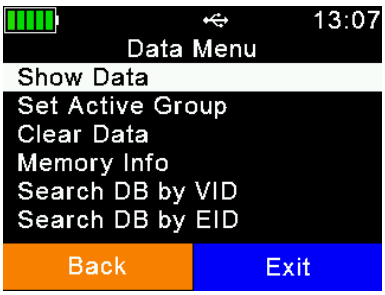
This example shows a '*Speed-Loop*'. In this case there is nothing to enter but the RFID reader is activated and tags are read continuously until the right soft key ('*Cancel*') is pressed twice…



…then the device will ask for another confirmation. If the left soft key (here: '*YES*') is pressed, the records made until now will be saved and the process is finished. By pressing the right soft key ('*Cancel*') the APR600 will return to the reading loop and more tags can be read.

The sequence of a Task depends on the Task-Definition. In case there are 'logical' problems with the sequence or the collected data, contact your local distributor. Agrident is not responsible for such definitions.

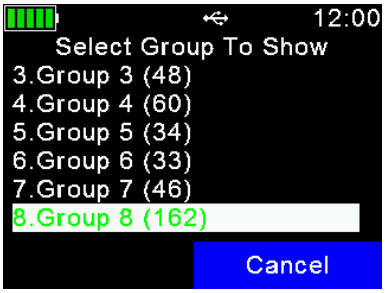
7.5 Data



The '*Data*' menu contains items for showing and deleting data and for selecting the active group. It is also possible to search an uploaded *DataBase* for a particular entry based on either the input of the *VID* or an *EID* (read tag), but only if a *DataBase* has been uploaded. If this is not the case, these menu items are not shown.

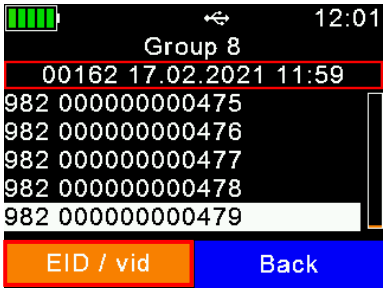
7.5.1 Show Data

When the item '*Show Data*' was selected, the device will show a list of all groups which are present in the memory. Each entry shows the group name and the number of records within the group in brackets. The active group is shown with green font.



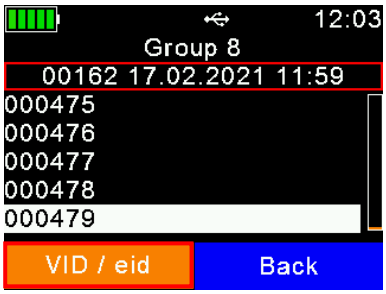
▼ … One group down
▲ … One group up
▶ … Scroll down 6 groups
◀ … Scroll up 6 groups
↵ … Select group

After a group has been selected, it will be opened and all records within this group are shown. The first display line shows the group name, here: '*Group 8*'. The second line shows the record number (within the current group) plus date and time of reading for the selected record. A scroll bar on the right side shows the approximate position of the selected record in this group (here it is the last record).



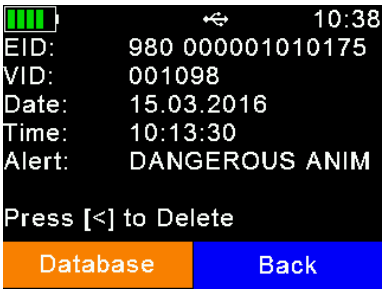
▼ … One record down
▲ … One record up
▶ … Scroll down 50 records
◀ … Scroll up 50 records
↵ … Select record
● … Switch between *EID* and VID view

When a group is opened, the device will automatically show the last (newest) record within this group. If you press ◀ + ▶ simultaneously, the reader will switch to the first record in the group and when ◀ + ▶ are pressed again, you can switch back to the last record.



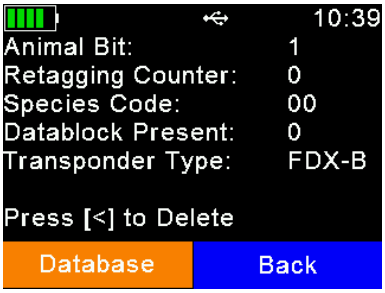
This screenshot shows the same list but instead of the *EID*, the *VID* is shown. Of course, *VIDs* must be available on the device, i.e. a *Link-List* or a *DataBase* has to be uploaded. If there is no *VID* available for specific records, the *EIDs* will be shown instead.

To show detailed information for a particular record, select an entry from the list and confirm with ↵. The details of the record are shown on two pages.



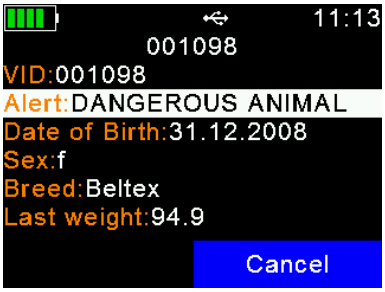
The first page shows the *EID*, the *VID*, date and time of reading and the *Alert* string, if there is one assigned.

▼ / ▲ / ▶ … Switch to next page
◀ … Delete record (only last record in active group)
● … Check *DataBase* (only if DB entry available)
↵ / ● … Return to list of records



Page two shows the so called 'advanced ISO information' like Animal Bit, Retagging Counter or Species Code. The tag type (FDX-B or HDX) is shown as well.

Press ● to open the appropriate *DataBase* record. If there is no *DataBase* entry available for this record, the APR600 will not show Database in the display.



You may also edit fields by selecting them and pressing ↵, if they are allowed to be editable in the *DataBase* definition. Non-editable fields are not selectable at all.

◀ / ▶ … Switch to next page
▼ / ▲ … Select next / previous (editable) *DataBase* field
↵ … open *DataBase* field (if defined to be editable)

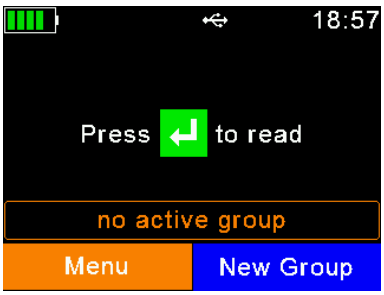
Example for a 2nd *DataBase* page

◀ / ▶ … Switch to next page
▼ / ▲ … Select next / previous (editable) *DataBase* field
↵ … open *DataBase* field (if defined to be editable)

How to edit *DataBase* fields depends on the field type (list, numeric, alphanumeric, etc.). This works similar to the different fields in *Task-Mode*.

7.5.2 Set Active Group

This function allows to select the group where new animals (tags) will be stored in. If new animals should be added to an existing group, set this group as the active one.



If no tags have been read yet, a message with the information '*no active group*' is shown on the home screen.

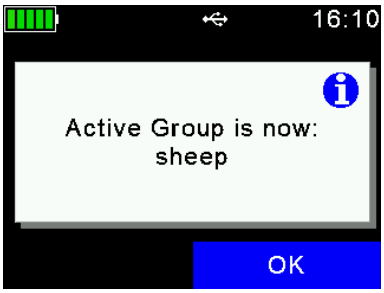
When a tag is read, the device will automatically create a new group with the name '*Group 1*'. If the group name shall be different, it is necessary to create a new group manually first before reading a tag – in this case the name can be modified.

If you want to add new animals to an existing group, set this group as the active group. This can be achieved using the menu item *Set Active Group* in the *Data* Menu:

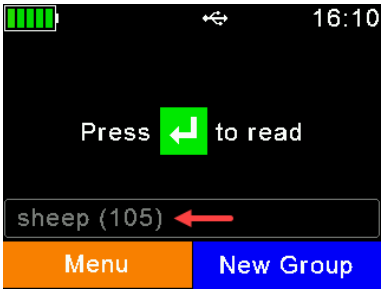
The currently selected group is shown in green font.

Use the ▼ / ▲ keys to select the desired group and the ◀ / ▶ keys for moving to the previous or next page.

In the example shown on the left side, the currently active group is '*cows*' and the cursor is located at '*sheep*'. Press ↵ to make '*sheep*' the active group.

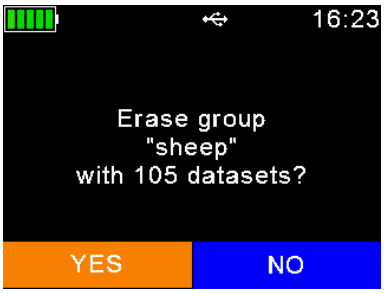


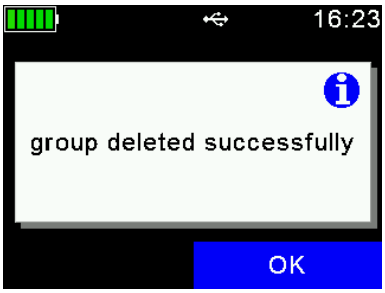
The reader shows a confirmation message with the information that the new active group is '*sheep*'. All tags which are read from now on will be saved in this group until a different group will be set as the active one.



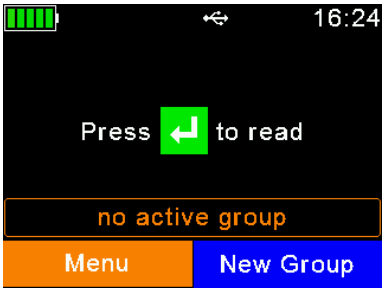
The name of the active group is shown on the home screen with the amount of records in that group in brackets. A maximum of 10.000 records can be saved in one group.

If the active group is deleted:

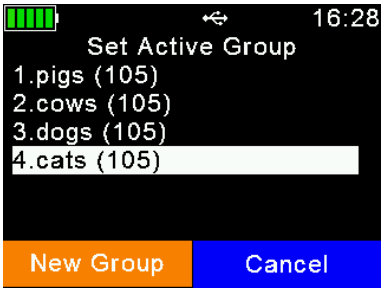




… the info line on the home screen shows an appropriate information: '*no active group*':



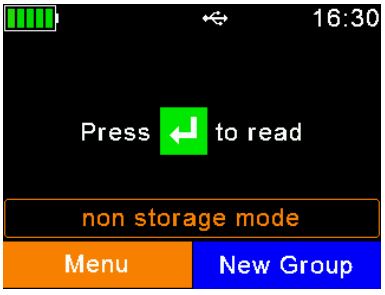
If a reading attempt is started in this case, the device will show the menu for selecting the active group from the list of existing groups:



Because records are always stored in groups, it is mandatory to define an active group. Select a group to be the active one.

Alternatively, one can create a new group here by pressing the ● key.

If the reader was configured to '*non storage mode*', this will be indicated on the home screen:



In this operating mode, records will not be saved to the internal memory at all. Hence, groups will not be used.

7.5.3 Clear data

It is possible to delete collected data on the APR600. There are different options for erasing data, also depending on the way they have been collected in. As already explained earlier in this manual, the standard records are saved in groups. These are the records which have been saved upon tag reading started from the home screen. If *Task-Mode* is used on the device, it is also possible to delete collected Task-Data from the '*Clear-Data*' menu – if not, this menu is hidden.

After selecting '*Clear Data*', two submenus are shown.

Clear Groups: refers to records made in groups

Clear Task Data: only applies for data collected in *Task-Mode*

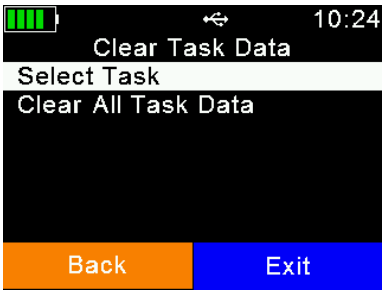
Note that deleted data are lost irreversibly. It is not possible to undo this action at all. I case of doubt, you should backup the data first.

7.5.3.1 Clear Groups

Select Group: opens the list of groups to select a specific group to delete

Clear All Groups: Erases ALL groups from the device memory (no Task-Data and no *DataBase*)

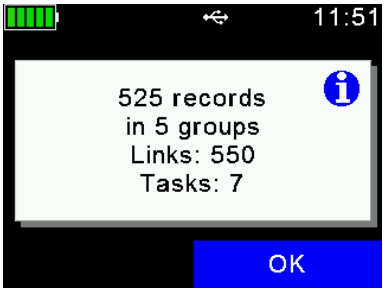
7.5.3.2 Clear Task Data



Select Task: only the data of one particular Task will be erased

Clear All Task Data: erases the Task data of ALL Tasks which are present on the device

7.5.4 Memory Info

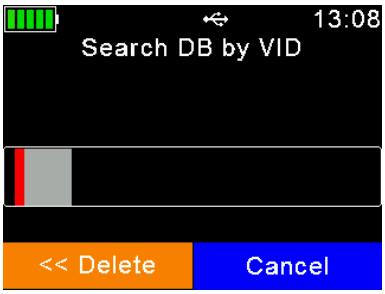


This menu item shows information concerning the amount of collected data (how many records in how many groups), the number of entries in the currently uploaded *Link-List* or *DataBase* and how many Task definitions have been uploaded.

It does not show how many records are present for each Task definition. Therefore enter the Task menu, select a Task and use '*Show Memory Info*' (7.4).

7.5.5 Search DB by *VID*

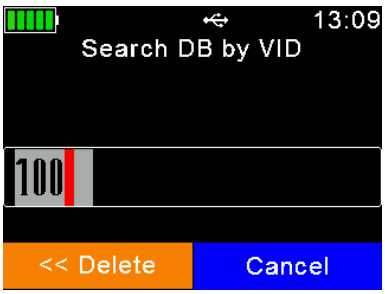
It is possible to search entries in the uploaded *DataBase* by entering the *VID*. This can make sense if the *EID* tag is lost or defective. But usually scanning the tag is the faster way and more convenient. Note that this menu item is only shown if a *DataBase* has been uploaded to the device.



Use the ▼ / ▲ keys to change the character and the ◀ / ▶ keys to move to the previous / next digit.

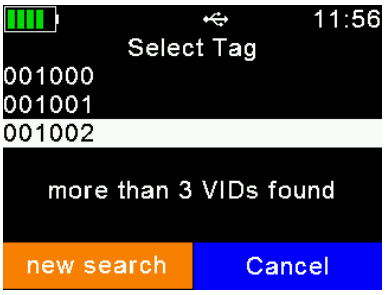
When browsing through the list of characters, you can hold the ▼ or ▲ key to increase the scrolling speed. Alternatively, the alphanumeric keys can be used for entering the *VID* to search for.

Press ● to leave the *VID* search.

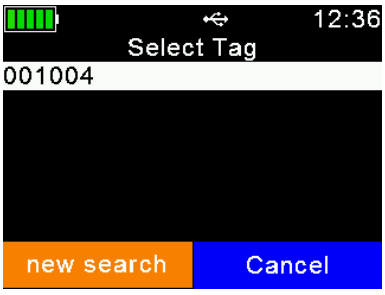


Press the ↵ key when enough digits have been entered.

The ● key deletes the last digit, if you hold it for one second, all digits will be erased.



In this example the device has found more than three matching *DataBase* entries. Press ● to narrow the search by entering more digits.



Now there is only one matching item left. Press the ↵ key to access the *DataBase* for this entry.

The *DataBase* entry for the selected *VID* will be shown as usually.

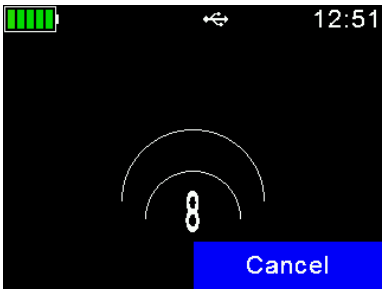
You may move to the previous / next (editable) field by using the ▼ / ▲ keys and switch between the different pages via ◀ or ▶.

The ↵ key allows to modify data if the field is configured to be editable.

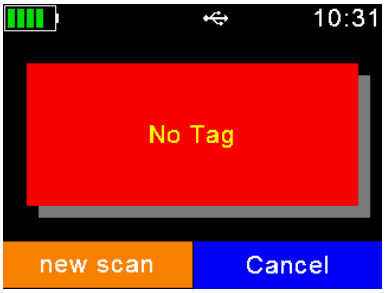
Non-editable fields are only shown but can neither be selected nor modified. In this case the *DataBase* 'creator' did not want to allow editing this information.

7.5.6 Search DB by *EID*

This menu item searches the *DataBase* for a matching entry based on the electronic ID. As soon as the tag was read, the APR600 will start looking up this number in the *DataBase*. Note that this menu item is only visible if a *DataBase* has been uploaded.

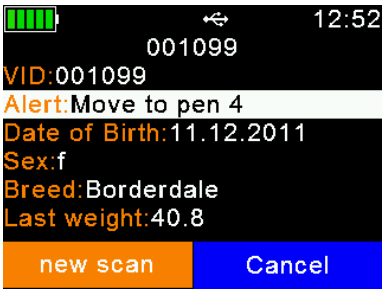


The APR600 starts scanning for a tag for a maximum of 10 seconds. The remaining scanning time in seconds is shown.



If the timeout has elapsed without a successful detection of a tag, the message '*No Tag*' will be displayed. The ● key allows to start a new scan and ● will abort the *EID* search.

In case the tag was read but there is no match in the *DataBase*, '*Not in database*' is shown.



As soon as a tag has been read AND there is a match in the *DataBase*, the entry will be shown.

You may move to the previous / next (editable) field by using the ▼ / ▲ keys and switch between the different pages via ◀ or ▶.

The ↵ key allows to modify data if the field is configured to be editable.

Non-editable fields are only shown but can neither be selected nor modified. In this case the *DataBase* 'creator' did not want to allow editing this information.

The difference to scanning for tags from the home screen is that no record will be created here – this is just a '*DataBase* lookup'.

7.6 Print

The APR600 allows to send the collected records to a mobile Bluetooth printer. There are different options available for the printing procedure, like printing the active group, printing a specific group or printing all groups. It is also possible to change basic printer settings here.

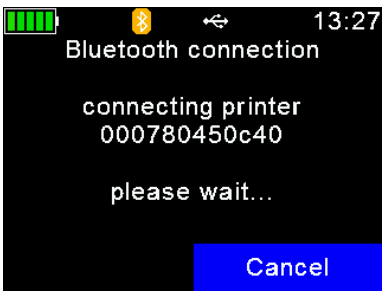
Ensure that your printer is set up correctly before you try printing records.

The APR600 stores the printers Bluetooth address as a secondary address only. When no print jobs should be done, the APR600 would always try to connect to its primary Bluetooth partner, like a computer, smartphone, PDA or weighing indicator in Master Mode. When one of the printing actions is started, the reader drops the connection to the primary device and tries to connect to the configured Bluetooth printer.

After the '*Print*' menu was left, the connection to the printer will be dropped and the APR600 tries to re-connect to the configured primary Bluetooth partner again (if in Master Mode). The huge advantage is that the user does not need to select a different Bluetooth device just for printing.

7.6.1 Print Active Group

Once selected, the APR600 tries to connect to the configured printer. If connected, this connection remains active until the '*Print*' menu was left.



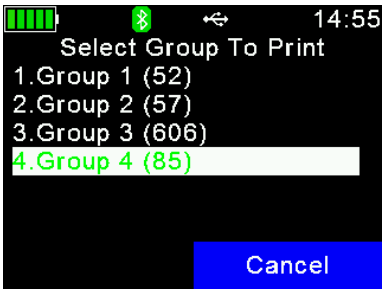
The reader is trying to connect to the Bluetooth printer. When the connection was established, printing will be started immediately.

If lots of data have to be printed, a progress bar is visible. When only a few datasets are sent to the printer, you might not see it at all.

The APR600 returns to the printer menu afterwards.

7.6.2 Select Group

This menu item allows to print a particular group instead of the active one or all groups.



Select the group to be sent to the printer using the ▼ / ▲ keys and confirm with ↵. The active group is displayed in green font.

If the Bluetooth connection has not been established yet, the APR600 will try to connect to the mobile printer now as explained in the previous chapter.

If the connection to the printer is established, printing will start right away.

After printing was finished, the reader returns to the screen shown above.

7.6.3 Print All Groups

This option should be used if the complete memory content, resp. all groups, should be printed. The procedure is similar to '*Print Active Group*', there are no further selections required.

7.6.4 Print Barcode

It is also possible to print a barcode of a particular *EID*. This can be useful if you want to label blood samples, for example. To be able to print the *EID* as a barcode, the APR600 has to read the tag first. When you select '*Print Barcode*', the device will activate the RFID engine. After the tag has been read, the APR600 is sending an appropriate command to the mobile printer.

The barcode type is '2of5 interleaved'. Other barcode types are not supported at the moment.

7.6.5 Setup Printer

Before you can use the printer, the correct model must be selected first. If this setting is incorrect, the printer feature will not work. There are much more options and configurations available, but this would be too much for including it into the APR600 menu. So, all the additional options are only software configurable. For example, *AgriLink* can be used for configuring all possible printer options.

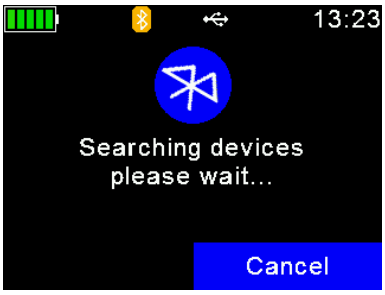
7.6.5.1 Set Printer Type

The APR600 Firmware supports several different printer types, like the Able Systems '*AP1300*', the Datamax-O'Neil '*Apex*' series (former Extech Apex), the Zebra QL-series and QLn-series, the Martel '*MCP 1880/7880*' and the '*MTP-3*' (GOOJPRT). The type '*Generic Line Printer*' might work for particular printers as well, but there are no special control codes send for this printer type – so it can only work for simple ASCII printers.

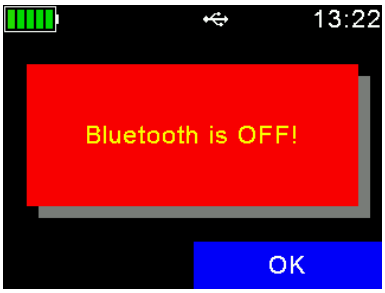
Select the correct printer type from the list by using the directional keys and confirm by pressing the ↵ key.

7.6.5.2 Search BT Printer

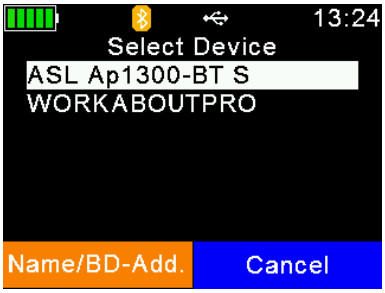
Before you can start printing via Bluetooth, the APR600 has to be paired with a printer. Therefore, the reader has to scan for available Bluetooth devices first. Once this menu item has been selected, the APR600 will start the scan.



Depending on how many devices are present, the scan can take a while, but at least 10 seconds.

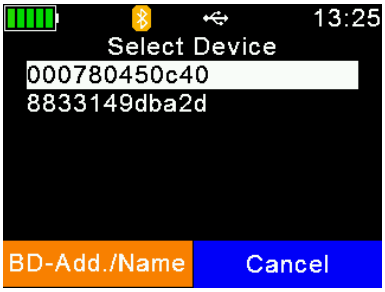


If Bluetooth is switched off, the APR600 shows the corresponding error message. In this case activate Bluetooth first (see chapter 7.7.3.3)



After the scan has been completed, the available devices are listed. Note that not only printers are listed here, but also other Bluetooth devices. So, ideally you should know the device name of your Bluetooth printer.

Sometimes it might be useful to see the BD-address of the found devices instead of the names. You may switch between both views by using the ● key.



Now you can see the list of discovered devices with their BD-addresses instead of the device names. Very often, the BD-address can be found somewhere on a label of a Bluetooth device. Since this address is unique, it can quickly help to identify the correct device.

Choose a device from the list and select it by pressing ↵. The APR600 will store this device as the Bluetooth printer and will try to connect to it for all coming print jobs until a different printer has been selected.

7.7 Setup

The APR600 is very flexible concerning its configuration. Several settings can be adjusted directly in the device menu. However, it does not make sense to allow the modification of all possible reader settings on the device itself – this would make the menu structure far too complicated. Settings which cannot be modified on the APR600 itself, are software-adjustable.

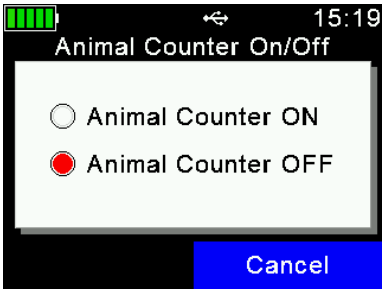
A possible software for altering all possible APR600 settings is *AgriLink*. A setup of this program is located on the internal memory card.

The setup menu is divided into several other menus and submenus, which will be explained in this chapter. The overview of the complete menu structure is explained in chapter 7.1.

7.7.1 Reader Settings

7.7.1.1 Animal Counter On/Off

The animal counter decides about the question if double reads are saved or not. A double read occurs if a tag with one and the same *EID* is read within the same group again. When the animal counter is activated, it is not possible to store the same *EID* within the same group again. If not activated, it is possible to do that - the APR600 does not check for double reads then.



Decide whether the Animal Counter should be activated or not using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.

The display also looks different after reading a tag depending on how this settings is configured:

Animal Counter = off

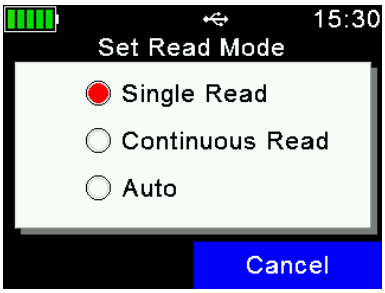
Animal Counter = on

When the Animal Counter is not activated, the current group and the number of records in this group is shown but the records can also include duplicate *EID*s. When the Animal Counter is activated, the displays shows '*Animals*' instead of '*Records*' – duplicates are not possible here.

7.7.1.2 Set Read Mode

Per factory defaults, the APR600 is configured to '*Single Read*'. This means that RFID is activated until a tag has been detected or the '*Single Read Time*' (default = 10 seconds) has elapsed. The ↵ key has to be pressed to scan for tags again.

The APR600 also allows to use the '*Continuous Read*' mode. The RFID engine will not be de-activated after a tag has been read. It will continue scanning until the '*Continuous Read Time*' (default = 60 seconds) has elapsed. Every new tag read resets this timeout.

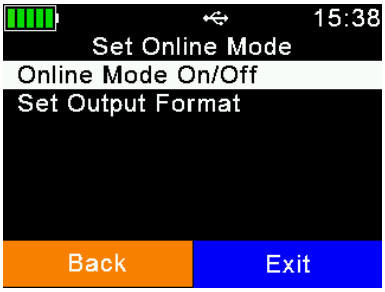


Select the Read Mode using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.

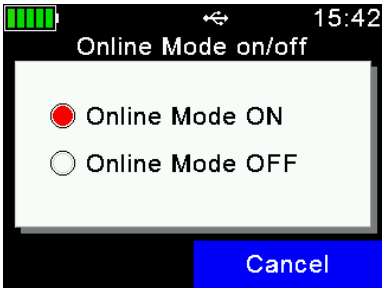
The setting '*Auto*' will start a Single Read on a short press of ↵ and Continuous Reading on a long press (> one second).

7.7.1.3 Set Online Mode

The Online Mode deals with the format used for sending the *EID* to the interfaces directly after a tag has been read. The interface can be USB, Bluetooth or WLAN. Usually the *EID* is further processed on a third-party device then, like a weighing indicator or a smartphone. It is important to know which format is expected by this other device and to configure the correct one.

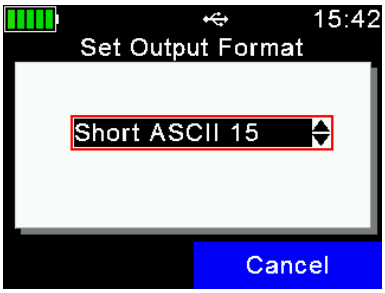


After selecting '*Set Online Mode*' a new menu appears. The first menu item allows to activate or deactivate the Online Mode completely, the second decides about the format used for sending the *EID*.



The Online Mode is switched on per default. When switched off, the APR600 will not send the *EID* to the several interfaces after reading a tag! So, it is not recommended to disable it unless absolutely required.

Select the desired setting using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.



Select the correct output format via ▼ or ▲ and confirm with ↵.

The default output format is '*Short ASCII 15*'. This is sending the 3-digit country code directly followed by the 12-digit national ID (no space in between), terminated with <CR><LF>. This format is quite common and accepted by most weighing indicators on the market.

There is a buffer of 20 IDs for sending the tag number over Bluetooth or WLAN. This buffer is used for bridging short-term interruptions of the wireless connection. If the connection drops, the IDs will be written into this buffer and sent in one go as soon as the connection has been established again.

You can select not to allow further readings if the buffer is full. Per factory defaults this setting is not activated and reading is always possible. In case the buffer is full, the oldest records in the buffer will be overwritten.

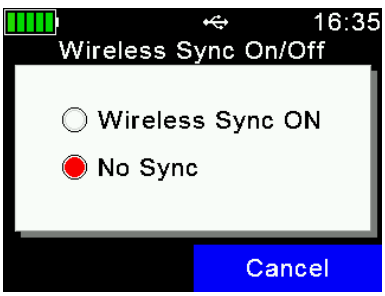
Select the desired setting using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.

7.7.1.4 Wireless Sync On/Off

RFID readers according to ISO11784/11785 have activation and listening periods. If two or more readers operate in close vicinity, they should be synchronized to prevent interference and hence a reduction of reading performance, especially for HDX tags.

Since it is not possible to synchronize mobile readers wired in the field, Agrident readers offer a feature called '*Wireless Synchronization*'. This function was mainly invented to allow mobile devices the operation close to stationary readers without interfering with them. But also, several mobile readers can synchronize wirelessly.

If you have other ISO11784/11785 readers operating close to the APR600, it is highly recommended to activate this function.

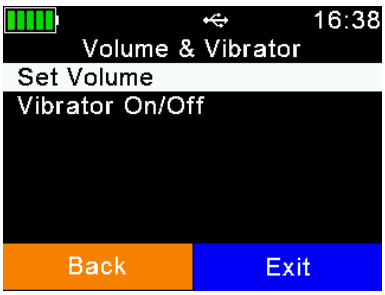


Select the desired setting using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.

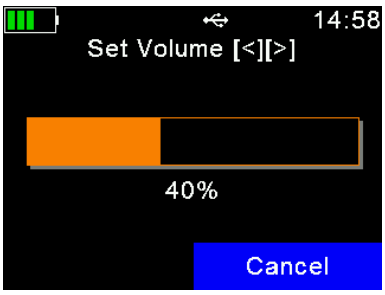
If stationary readers are used, the Wireless Synchronization works best if everything is Agrident equipment because **A**grident **S**tationary **R**eaders (ASR) also offer Wireless Synchronization and hence fixed timings which also allow best possible performance for wirelessly synchronized mobile readers.

7.7.1.5 Volume & Vibrator

The APR600 provides a speaker and a vibrating motor for signalization in addition to the LEDs and the display. These can be configured in this menu.

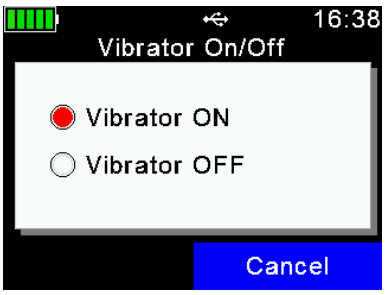


After selecting '*Volume & Vibrator*', a new menu is shown. The first menu item allows to set the speaker volume, the second is used to activate the vibrating motor or to deactivate it.



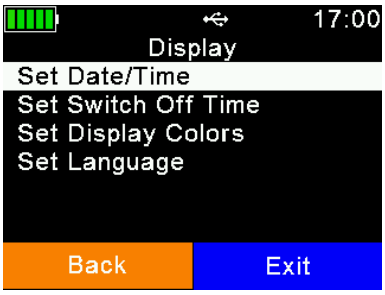
Select the desired volume by using the ◀ / ▶ keys. Each time a key is pressed a sound is played to indicate the currently selected volume.

Confirm the selected volume with ↵.



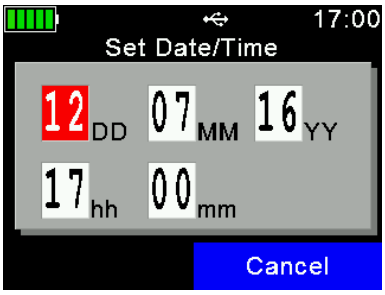
Select the desired setting via ▼ or ▲ and confirm with ↵.

7.7.2 Display



The Display menu contains the items shown on the left side. Use the ▼ / ▲ / ◀ / ▶ keys to select a setting and enter the item via ↵.

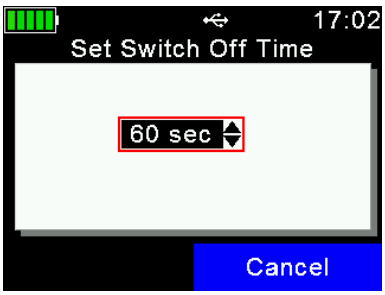
7.7.2.1 Set Date/Time



DD … Date - Day
MM … Date - Month
YY … Date - Year
hh … Time - Hour
mm … Time - Minute

▼ / ▲ … Modify value in the current field
◀ / ▶ … Switch to previous / next field
↵ … Apply the new settings

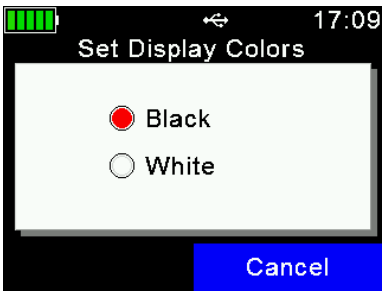
7.7.2.2 Set Switch Off Time



The '*Switch Off Time*' determines after which period (of no action) the APR600 enters suspend mode. Any action, like a key press, will reset this timer. Also see chapter 5 for further details. The maximum possible time is 60 minutes, but keep in mind that this reduces the operating time.

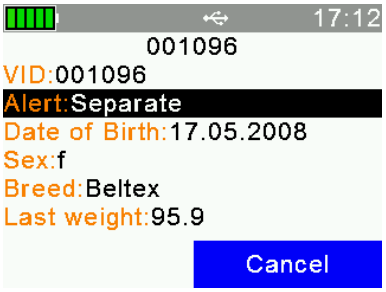
▼ / ▲ … Modify the *Switch Off Time*
↵ … Apply the new setting

7.7.2.3 Set Display Colors



Depending on the light conditions it can make sense to invert the background color. It can also be a question of the users personal preference. That can be done within this submenu.

▼ / ▲ / ◀ / ▶ … Change the setting
↵ … Apply the setting

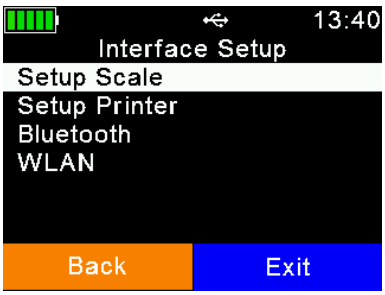


7.7.2.4 Set Language

The default display language is always English. It is possible to upload up to 29 custom languages. If the language you want to use is not available, contact your local distributor for further details.

▼ / ▲ … Select the desired language
↵ … Set the selected language

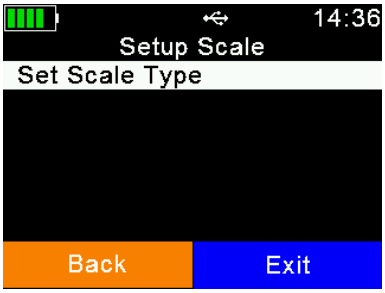
7.7.3 Interface Setup



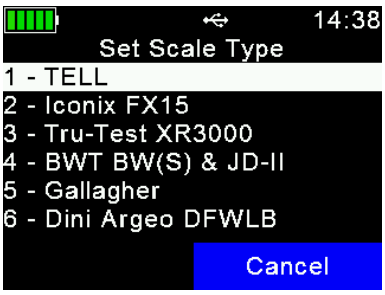
The *Interface Setup* contains settings for configuring the APR600s wireless interfaces (Bluetooth or WLAN). The scale and printer settings can be configured here as well.

7.7.3.1 Setup Scale

The APR600 can receive the weight from indicators which can send it via Bluetooth. There are different scale types supported, also from the major brands on the market. This function can be used with '*Join Data*' (*EID + Weight*) or for *Task-Mode* and the ***D**ata-**B**ase-**F**unction*, where the so called '*Weight-from-Scale*' field is available.



There is only one menu item where the correct scale model needs to be configured.

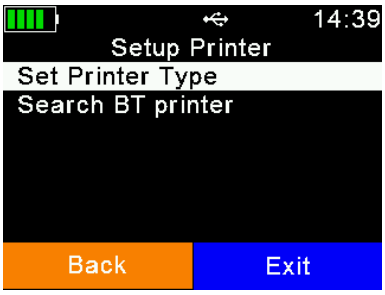


Choose the correct type depending on the model you have.

▼ / ▲ / ◀ / ▶ … Select the scale type
↵ … Apply the setting

Scales without integrated Bluetooth might be upgraded by using an external adapter. Contact your local distributor for further details.

7.7.3.2 Setup Printer

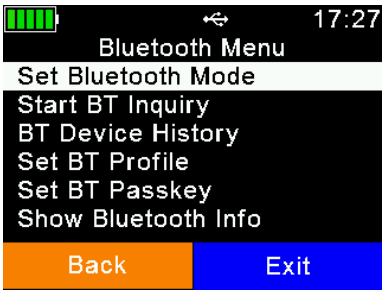


The printer setup is the same as described in chapter 7.6.5, here is just another menu entry for configuring the same settings.

7.7.3.3 Bluetooth

The APR600 always incorporates a Class1 Bluetooth module. The range is up to 80 meters in 'line of sight'. Inside buildings or when any other obstacles are present, it will be less. Note that the range also depends on the Bluetooth partner. If the other device is only Class2, the range is much lower. This especially applies to devices like smart phones.

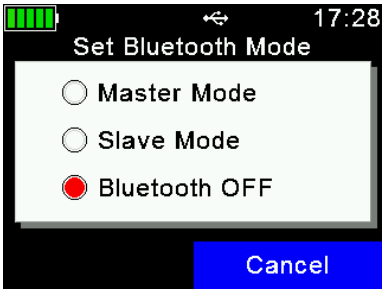
There are several menu items for Bluetooth, which will be explained in this chapter.



The Bluetooth menu contains the items shown on the left side.

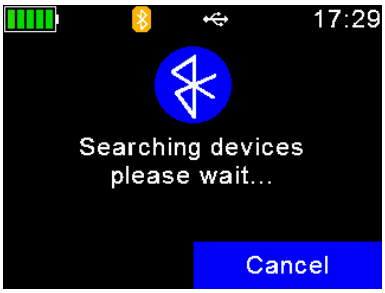
▼ / ▲ … One item down / up
◀ / ▶ … Switch to first / last item
↵ … Enter submenu resp. start action (*BT Inquiry*)

The *Bluetooth Mode* determines if the APR600 should initiate the connection to another device (Master Mode) or if other devices should be able to connect to the APR600. Per default, Bluetooth is not activated (OFF), so it must be switched on first. Then you have to decide whether the APR600 should be the device initiating the connection (Master) or the other device (Slave).

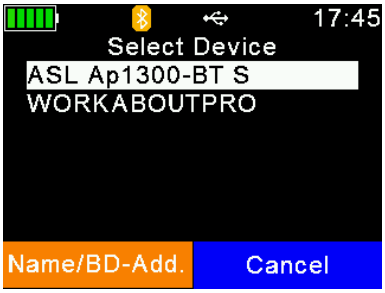


Select the desired Bluetooth Mode using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.

When the APR600 is in Master Mode, it needs to 'know' the address of the intended Bluetooth partner, also called 'remote device'. An easy way to find out this address is to scan for Bluetooth devices in range. Make sure the other device has Bluetooth activated, that it is 'discoverable' and 'connectable' and that it is in range. For smart phones, for example, it is normally required to make them discoverable first, usually for a particular time. This can be done in the phones Bluetooth settings. If this has been done, select '*Start BT Inquiry*' and press ↵.

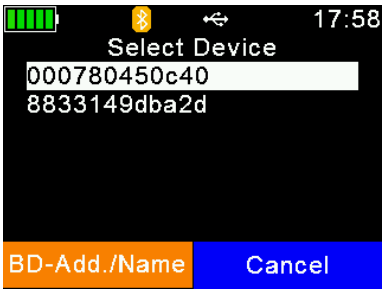


The APR600 starts scanning for other Bluetooth devices in range. This can take quite a long time, also depending on how many devices are found, but at least 10 seconds.



The discovered devices are listed after the scan, sorted according to their names.

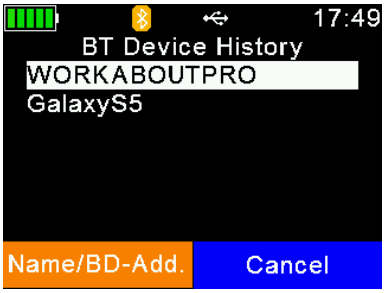
Sometimes it might be useful to see the BD-address of the found devices instead of the names. You may switch between both views by using the ● key.



Now you can see the list of discovered devices with their BD-addresses instead of the device names. Very often, the BD-address is somewhere on a label of a Bluetooth device. Since this address is unique, it can help to identify the correct device quickly.

Choose a device from the list and select it by pressing ↵. The APR600 will store this device as the Bluetooth partner and will try to connect to it automatically and permanently if the reader is configured to Master Mode.

Usually there should not be too many Bluetooth devices in use with the APR600. To prevent unnecessary scans when switching from one Bluetooth partner to another one, the reader stores a '*Bluetooth Device History*'. This list includes the devices, which were selected as Bluetooth partner in the past. So, scanning for already known devices is not required.



Choose a device from the history to change the Bluetooth partner. The APR600 will then use this device as remote device until further changes.

▼ / ▲ … Select a device from the history
↵ … Set the device as the new remote device

The APR600 supports five different Bluetooth profiles: Serial Port Profile (SPP), iAP, Human Interface Device (HID) (+ HID smart) and Bluetooth Low Energy (BLE), where BLE is more or less another technology rather than a profile.

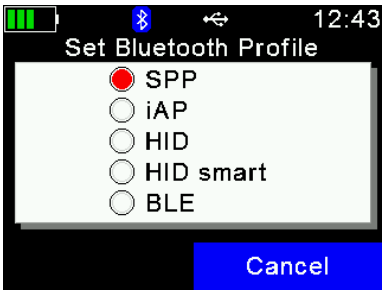
SPP emulates a serial cable to provide a simple replacement for RS232 connections. Commands can be sent into both directions – it uses virtual serial ports.

iAP: The readers Bluetooth module is compliant with Apple's iPod® Accessory Protocol. This profile offers a serial-port-like communication over Bluetooth in combination with iOS devices.

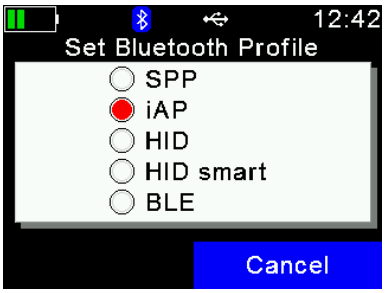
HID is used for 'typing in' the *EID* sent via Bluetooth into text fields of applications running on the host device. This removes the need to develop a serial interface for the reader. The APR600 is connected to the host as a 'virtual keyboard'. When the cursor is in a text field in the app running on the host, the *EID* is filled into this field after a tag has been read. Note that it is not possible to send commands to the APR600 in HID mode – communication only works into one direction here.

HID smart: Same as HID but the connection to the other device is only established after a tag has been read. This is required for the use with Apple devices because as long as a Bluetooth device is connected as HID keyboard, the on-screen keyboard will not be available at all.

BLE is reserved for special applications at the moment.

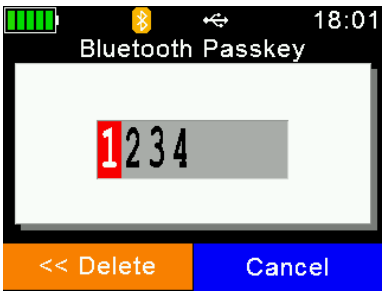


Choose the desired Profile using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.



If you want to connect the reader to an iOS device for a 2-way communication, you have to select '*iAP*' instead of '*SPP*' because when '*SPP*' is selected, the APR600 cannot connect to an Apple device.

For allowing a successful Bluetooth connection, the passkeys on both devices have to match, otherwise the connection cannot be established.

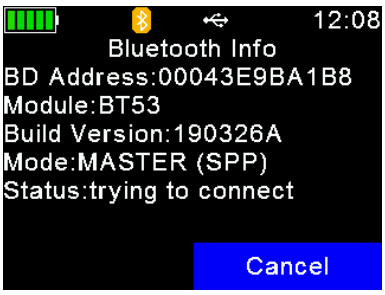


Use the ▼ / ▲ keys to change the character and the ◀ / ▶ keys to move to the previous / next digit. When browsing through the list of characters, you can hold down the ▼ or ▲ key to increase the scrolling speed.

The ● key deletes the last digit. If you hold it for at least one second, all digits will be erased.

Press the ↵ key to set the passkey.

The menu item '*Bluetooth Info*' shows some Bluetooth hardware and firmware related information, the configured Bluetooth Mode & Profile and the connection status. Details concerning the color of the Bluetooth symbol depending on the connection status are explained in chapter 4.1.2.3.



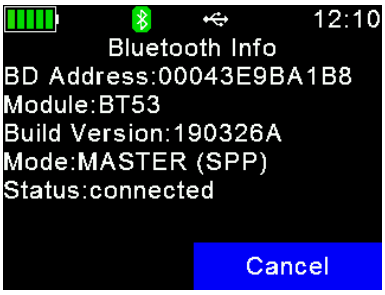
BD Address: Bluetooth Device Address of the APR600s Bluetooth module, unique worldwide

Module: Bluetooth model, built into the reader; here: '*BT53*'

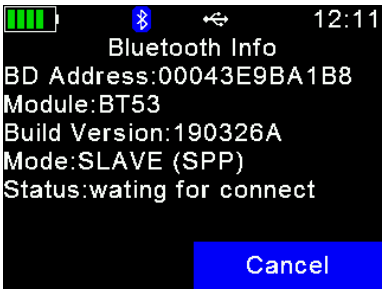
Build Version: APR600s Bluetooth module Firmware version

Mode: Bluetooth Mode plus Bluetooth Profile in brackets

Status: Connection Status, here: tries to connect to remote device



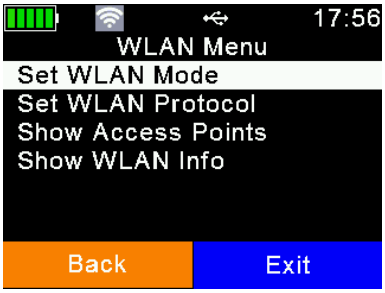
In this case the APR600 is connected to the remote device. When the connection would drop, the reader would try to reconnect to the configured Bluetooth partner until successful. This is done automatically.



Here the APR600 is configured to be the Bluetooth Slave. It is discoverable by other devices and it is connectable. The reader will not try to connect to a remote device in this configuration but it will just wait for incoming connections.

7.7.3.4 WLAN

The WLAN function of the APR600 requires basic knowledge about networks and WLAN. It is recommended to let an IT specialist configure the required settings.



The WLAN settings available on the device itself are only basic ones. Showing all possible settings would make the menu too complex, hence the advanced settings are only software configurable – e.g. via *AgriLink*.

But usually it is not required to modify these settings again and again – an initial configuration is normally enough if the IT infrastructure remains the same.

WLAN is not activated per factory default settings. Before it can be used, it has to be switched on. There are two possible operating modes available, '*Station*' and '*Access Point*'.

Station:

This operating mode for WLAN is probably the most common scenario. There is an existing WLAN infrastructure containing a wireless Access Point and the reader should join it.

The Access Point has an **SSID** (**S**ervice **S**et **ID**entifier) which makes it discoverable and connectable – one could also call it 'network name'. The SSID has to be configured correctly via software (like *AgriLink*), it has to match with the SSID used by the Access Point.

Usually WLAN connections use security mechanisms like '**authentication**'. The APR600s WLAN module supports 'no authentication' or '*WPA2*'. Authentication methods different from WPA2 (like WEP or WPA) turned out to be insecure and hence are not supported.

If WPA2 is selected as authentication method, the '*passphrase*' configured for the Access Point has to match with the one set for the APR600. Note that the passphrase is also case-sensitive!

The easiest way for allowing the APR600 to join the Access Point is to let the Access Point work as a DHCP server. This means that IP addresses are assigned automatically.

If all those settings are configured correctly, the APR600 should be able to join the Access Point.

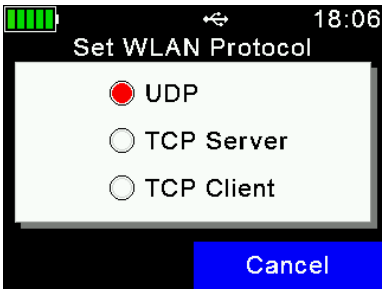
Access Point:

When the APR600 is configured to '*Access Point*' it will not try to join another Access Point but it will create an own one. This is comparable with the 'mobile hotspot' function on smartphones even though the APR600 has no internet access, of course.

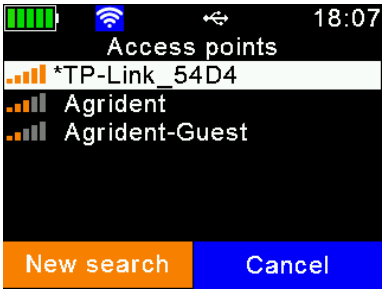
Select the desired WLAN Mode using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.

When the APR600 joined an Access Point or another device has joined the APR600 (in case the reader creates the Access Point), this does not mean that communication is possible already. In addition, a UDP or TCP connection must be opened before data can be exchanged!

Depending on the application, a UDP or TCP connection must be established and an appropriate port must be opened. It is not part of this manual to explain those things – information about such items can be found in commonly available literature.

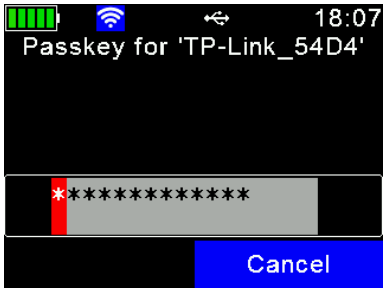


Choose the correct WLAN Protocol (depending on your application) using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵ .



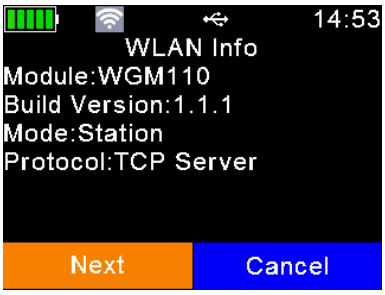
The menu item '*Show Access Points*' is only visible if WLAN is enabled and set to '*Station*' Mode. It is listing the currently available Access Points plus a signal strength indication. You may also connect to an Access Point from here by pressing ↵.

In case the Access Point uses WPA2 security, you are prompted to enter the passphrase. In order to change it, press any of the ▼ / ▲ / ◀ / ▶ keys. A virtual keyboard opens where the passphrase can be typed in.



The menu item '*Show WLAN Info*' displays hardware and firmware information of the WLAN module, a summary of the currently configured basic settings and the connection status. Information about the color of the WLAN symbol depending on the connection status are explained in chapter 4.1.2.2.

The ***MAC*** Address is a unique 12-digit number which clearly identifies each network adapter worldwide. The ***SSID*** can be understood as the network name. ***Device*** and ***Host*** do not show anything yet because there is no connection. The ***Status*** '*connecting AP*' means that the APR600 is trying to connect to the configured Access Point but this was not successful yet. By pressing , the display switches to the next screen.



In the first line, the WLAN module type is shown. In case of the APR600, the module type is '*WGM110*'.

The ***Build Version*** shows the firmware version of the WLAN module.

The configured WLAN ***Mode*** is '*Station*' which means that the APR600 will try to join the configured Access Point.

The WLAN ***Protocol*** is '*TCP Server*', so the Host is the TCP Client and has to open the correct port for the correct IP address.

Now the APR600 has joined the configured Access Point (WLAN symbol turned into blue) and the ***Status*** has changed to '*waiting for connect*'.

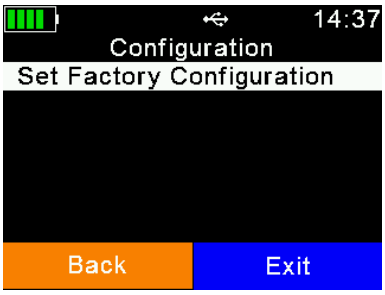
Device shows the IP address (*192.168.0.104*) of the APR600 plus the configured port (*2010*).

Now the host can open a connection by using this IP address and this port.

Here the host has opened the connection (WLAN symbol turned into green) and the devices can communicate.

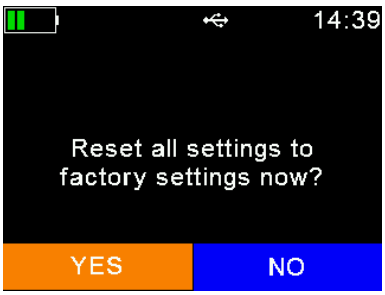
The ***Host*** has the IP address '192.168.0.103' and it has connected to the APR600 using IP address '192.168.0.104' and port '2010'.

7.7.4 Configuration



After selecting '*Configuration*', the menu shown on the left side will be displayed.

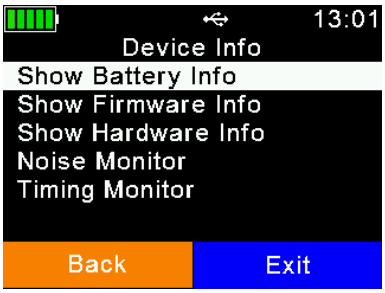
7.7.4.1 Set Factory Configuration



'*Set Factory Configuration*' puts all settings back to the factory default values. This might be useful if specific settings have been changed and the APR600 is not operating as intended anymore. Note that this action cannot be undone. Settings different from the factory defaults must be made again.

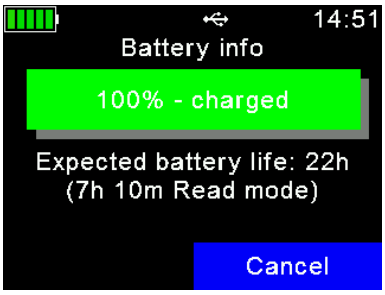
…confirm reset
… abort reset

7.7.5 Device Info



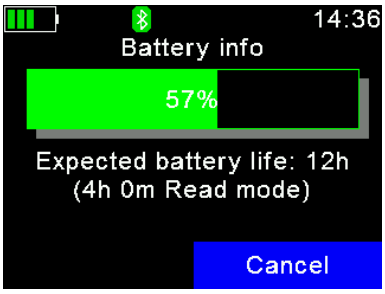
The menu '*Device Info*' includes items showing information about the current battery status, the APR600 firmware and some information on the hardware.

7.7.5.1 Show Battery Info



When fully charged, the battery info shows '*100%*'.

Below the charging indication, the display shows rough estimates concerning the remaining operating time in standby mode (APR600 running but RFID engine is off), here 22 hours, and in continuous read mode, here 7 hours and 10 minutes.



In this example the battery capacity is at 57 percent. The expected standby time is 12 hours and in continuous read mode there are 4 hours left.

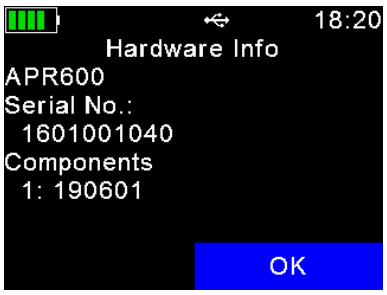
Bluetooth is activated in this example; this is also included in the calculations as well as WLAN. So, the shown expected battery life considers all electric consumers that are currently active.

Details concerning the battery symbol in status bar are explained in chapter 4.1.2.1.

7.7.5.2 Show Firmware Info

The item '*Show Firmware Info*' displays the readers firmware version plus some additional information like build date and bootloader version. You should have that information available in case of a support request.

7.7.5.3 Show Hardware Info



The '*Hardware Info*' shows the readers serial number and the revision of the printed circuit board that is built into the device. You should have that information available as well in case of a support request.

7.7.5.4 Noise Monitor & Timing Monitor

These menu items are for support- and service purposes only.

8 Battery precautions

There are some important things to consider concerning the rechargeable battery pack. The allowed charge temperature is between 0°C to +45°C (32°F to 113°F). Discharging is allowed within the range of -20°C to +60°C (-4°F to 140°F) – this is the allowed operating temperature for the battery.

Storage instructions:

- For long-term storage, the battery should have a charging state of 30-70% for preventing a permanent loss of capacity.
- It shall be kept in dry condition of low humidity, especially be free from high temperature (45°C / 113°F or more). (Recommended Temperature 23°C / 73°F, Humidity 65±20% or less.)
- Do not storage the battery near heat sources, nor in a place subject to direct sunlight to storage in warehouse.

When using the battery:

- Misusing the battery may cause the battery to get hot, explode, or ignite and cause serious injury. Be sure to follow the safety rules listed below:
  - Do not place the battery in fire or heat the battery.
  - Do not install the battery backwards so that the polarity is reversed.
  - Do not connect the positive terminal and the negative terminal of the battery to each other with any metal object (such as wire).
  - Do not carry or store the batteries together with necklaces, hairpins, or other metal objects.
  - Do not penetrate the battery with nails, strike the battery with a hammer, step on the battery, or otherwise subject it to strong impacts or shocks.
  - Do not solder directly onto the battery.
  - Do not expose the battery to water or salt water, or allow the battery to get wet.
- Do not disassemble or modify the battery. The battery contains safety and protection devices which, if damaged, may cause the battery to generate heat, explode or ignite.
- Do not place the battery on or near fires, stoves, or other high-temperature locations. Do not place the battery in direct sunshine, or use or store the battery inside cars in hot weather. Doing so may cause the battery to generate heat, explode, or ignite. Using the battery in this manner may also result in a loss of performance and a shortened life expectancy.
- Do not insert the battery into equipment designed to be hermetically sealed. In some cases, hydrogen or oxygen may be discharged from the cell which may result in rupture, fire or explosion.
- Immediately discontinue use of the battery if, while using, charging, or storing the battery, the battery emits an unusual smell, feels hot, changes color, changes shape, or appears abnormal in any other way. Contact your distributor if any of these problems are observed.
- Do not place the batteries in microwave ovens, high-pressure containers, or on induction cookware.
- In the event that the battery leaks and the fluid gets into one's eye, do not rub the eye. Rinse well with water and immediately seek medical care. If left untreated the battery fluid could cause damage to the eye.
- When the battery is worn out, insulate the terminals with adhesive tape or similar materials before disposal.

While charging:

- Be sure to follow the rules listed below while charging the battery. Failure to do so may cause the battery to become hot, explode, or ignite and cause serious injury.
  - When charging the battery, only use chargers supplied by Agrident.
  - Do not attach the batteries to a power supply plug or directly to a car's cigarette lighter.
  - Do not place the batteries in or near fire, or into direct sunlight. When the battery becomes hot, the built-in safety equipment is activated, preventing the battery from charging further, and heating the battery can destroy the safety equipment and can cause additional heating, breaking, or ignition of the battery.
- Do not continue charging the battery if it does not recharge within the specified charging time. Doing so may cause the battery to become hot, explode, or ignite.
- The temperature range over which the battery can be charged is 0°C to 45°C. Charging the battery at temperatures outside of this range may cause the battery to become hot or to break. Charging the battery outside of this temperature range may also harm the performance of the battery or reduce the battery's expectancy.

When discharging the battery:

- Do not discharge the battery using any device except for the specified device. When the battery is used in devices aside from the specified device it may damage the performance of the battery or reduce its life expectancy, and if the device causes an abnormal current to flow, it may cause the battery to become hot, explode, or ignite and cause serious injury.
- The temperature range over which the battery can be discharged is -20°C to 60°C. Use of the battery outside of this temperature range may damage the performance of the battery or may reduce its life expectancy.

Disposal considerations:

- Observe local, state and federal laws and regulations concerning battery disposal.
- Do not disassemble the battery!

9 Safety and care

The manufacturer accepts no liability for damage resulting from improper use or use not consistent with that described in these operating instructions.

- The APR600 Reader contains no parts that can be repaired by the user. For this reason, the Reader Electronic may only be repaired by authorized customer service personnel.
- In both operation and storage of the reader secure to comply with the environment conditions specified in the technical data.
- Clean the APR600 Reader only with a damp cloth. Use only water and any commercially available cleaning agent.

Any modification to the APR600 Reader Electronic will render the warranty null and void.

10 Warranty

The manufacturer of the APR600 Reader Electronic will provide a warranty of

12 months

from the day the device is shipped and subject to the following conditions:

1. Without submission of proof of purchase no warranty can be given.
2. In the event that defects are detected the manufacturer is entitled to choose between up to two attempts at repair or supplying a replacement device on one occasion. The warranty period for the repaired item or for a replacement item is 3 months but will always extend to the end of the original warranty period. No further claims can be entertained, especially claims for compensation for consequential losses. This exclusion of liability does not apply to claims based on the Product Liability Act.
3. Warranty claims cannot be entertained unless the Agrident system was installed properly and used properly and for the purpose intended.

No warranty obligations exist in particular when:

1. Damage is attributable to improper use of the device, to an incorrect connection or incorrect operator action.
2. The device was not cared for and maintained in accordance with the manufacturer's recommendations and this is the cause of the damage.
3. The damage is due to any modification to the device.

   The damage is due to force majeure, for example lightning strike.

   The damage is due to wear, resulting from overstressing mechanical parts.

11 International approvals

11.1 CE marking

Hereby, Agrident GmbH declares that the APR600, if used according to the instructions, is in compliance with the essential requirements and other relevant provisions of the Radio Equipment Directive (RED) 2014/53/EU. For use in all countries of the EU.

The complete EU Declaration of Conformity is available at the Internet address https://agrident.com/support/eu-declarations-of-conformity/.

In case of alteration of the product, not agreed to by us, this declaration will lose its validity.

This symbol indicates proof of conformity to applicable European Economic Community Council directives and harmonized standards published in the official journal of the European Communities.

CE

11.2 FCC and IC digital device limitations

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Interference Statement (Part 15.105 (b))

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

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

FCC Part 15 Clause 15.21

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

12 Apple – Legal Notice

iPod, iPhone, iPad are a trademark of Apple Inc., registered in the U.S. and other countries.

“Made for iPhone” and “Made for iPad” mean that an electronic accessory has been designed to connect specifically to iPhone, or iPad, respectively, and has been certified by the developer to meet Apple performance standards.

Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards.

13 Trouble shooting

For any problems, please contact your local distributor.