Allflex
Livestock Intelligence™
MSD Animal Health Intelligence

Allflex APR650 User Guide

Firmware v1.02 and higher

Revision

November 2021

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1 Introduction

The APR650 is a high quality, ruggedized portable RFID reader for EID tags complying with the ISO11784 / 11785 standard. It can read EID tags with FDX-B and HDX technology. In addition to the RFID part, the APR650 contains a 2D Barcode camera with a very good scanning performance. 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 (EID or Barcode) are transmitted via the several available interfaces (USB, Bluetooth and WLAN) directly after reading.
The APR650 also supports the Task-Mode and the Data Base Function (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 that displays various 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 usually do not supply more than 500mA, hence charging the APR650 over a USB port of a computer takes longer than charging it from the Allflex USB power supply.

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

3 Hardware Specifications

This section describes the APR650 hardware including all accessories.

3.1 APR650 Parts

- 190x98x40 millimeters long
- 280 grams
- Provides an excellent reading performance
- Large 2.4-inch color TFT display
- Two status LEDs above the display
- Speaker and vibrating body
- The Reader can be controlled with seven ergonomic keys and 12 alphanumeric keys below the display
- Uses a 3.7V Lithium-Ion battery with a capacity of 3.400mAh located in the body. 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

Accessory	Description
	The APR650 comes with a USB-A to Magnetic-Connector cable. The USB-A plug can be connected to any USB-port. Note that the appropriate USB driver must be installed first. If you need to use a USB extension, it should be a high-quality cable and no longer than two meters. The maximum USB Cable length is five meters and may cause problems such as slow charging or USB failures.
	The robust transport box ATB400 enables easy transportation of the APR650. It can accommodate the reader and accessories. Approx. 328x218x75mm
	The APR650 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.
	

3.3 Connecting the USB Cable

The APR650 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.

(1)

(2)

(3)

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

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

4 Controlling the APR650

The APR650 has a large color display and 19 keys used for controlling the device.

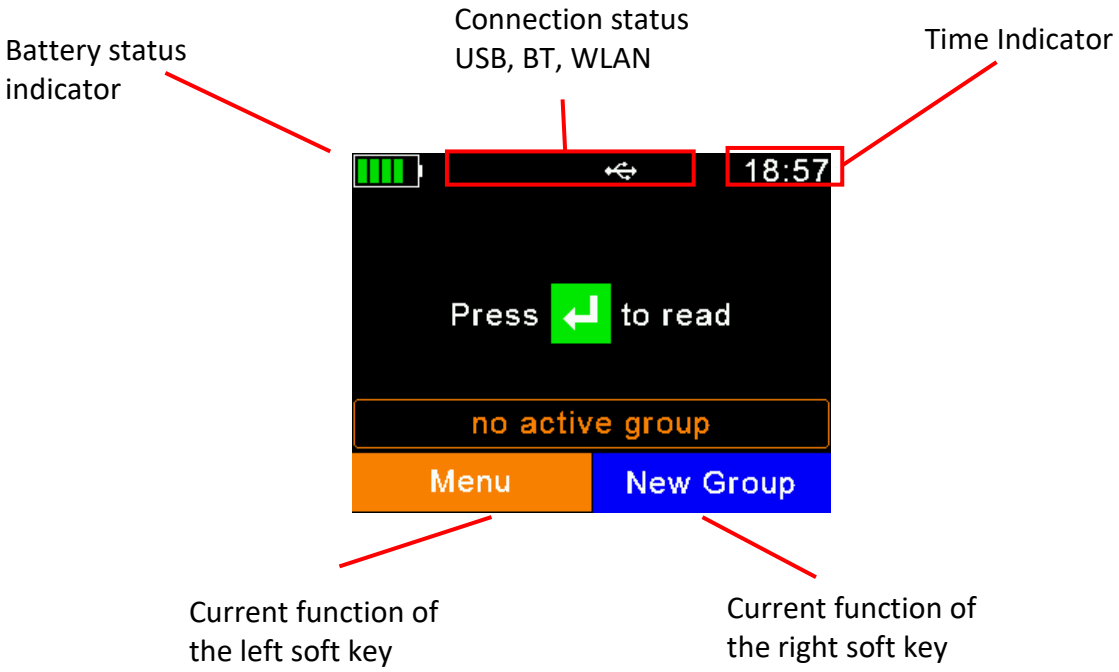
- The Reader is activated by pressing the ↵ key in the middle of the directional pad.

4.1 APR650 Display

These sections describe the APR650 Display.

4.1.1 Home Screen

Switch the reader on; the home screen appears:



- 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 when charging is not possible, like high temperature.
- 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*' can 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.

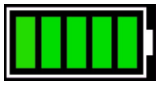
4.1.2 Symbols at the Top of the Display

The status bar in the first display line provides the time (on the right side) and 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.

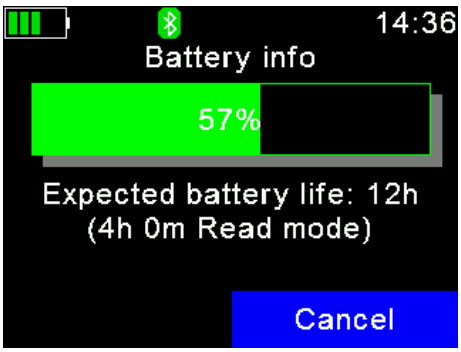
4.1.2.1 Battery Status

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 may no longer work correctly and should be replaced. This error also occurs when the battery is charged outside the allowed temperature range of 0°C to 45°C.

During charging, the battery symbol fills from the point of the remaining capacity. The battery charge is complete when flashing stops. The charger can be disconnected in this case.

The menu item '*Show Battery Info*' in the '*Setup*' menu 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 module is currently booting, being configured or a Firmware update is in progress

4.1.2.3 Bluetooth Status

Status	Meaning
	Slave Mode – APR650 can be connected from other devices
	Master Mode – APR650 is trying to connect to remote device
	Connected (in either Bluetooth Mode)
	Bluetooth init: Communication to Bluetooth module failed, a Bluetooth Firmware update is in progress, or booting in progress

4.1.2.4 USB Status

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

Status	Meaning
	The USB symbol displays when the APR650 is connected to the USB port of a computer or a USB Power Supply that is not detected as an Allflex Power Supply. In these cases Fast Charging is not possible.
	When the APR650 is connected to an Allflex USB power supply, the symbol changes from white to red, and Fast Charging is available.

4.2 Status LEDs

There are two status LEDs above the display:

- Left LED is a multicolor LED and color changes depending on the charging status.
- Right LED is blue, and it is used for indicating the connection status.

The RGB LED on the left side indicates the charging status of the battery pack as follows:

Status	Interval	Meaning
	Flashing, every second for 10ms	Battery is charging
	Solid	Battery is fully charged

The multicolor LEDs are only used when the APR650 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:

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

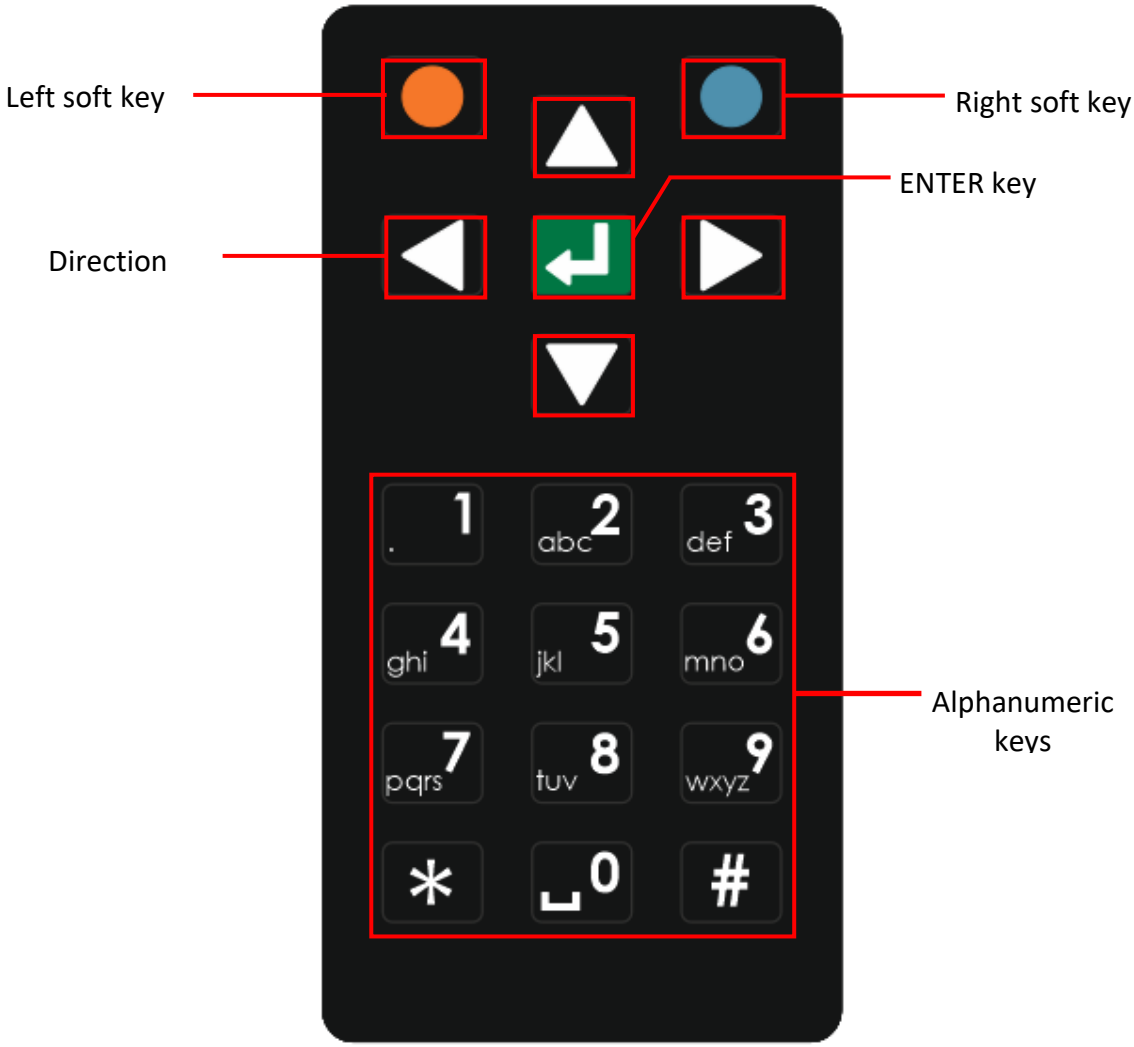
* Only for continuous reading mode and with activated animal counter. See 8.7.1.1 and 8.7.1.2 for more details.

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

Status	Interval	Meaning
	Flashing every 3 seconds	APR650 is in SD-Card-Mode
	Flashing once a second	APR650 is in Suspend-Mode (CDC)

4.3 Using the Keyboard

The APR650 has 19 keys to allow easy operation of the reader. The directional pad has an ENTER key in the middle and two additional soft keys below the display whose functionality is dependent on the current action.



Status	Action
	Opens 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).
	From the home screen, executes the configured ‘quick action’. Exits the menu completely and moves back to the home screen. Depending on the actual operation, other functions are shown in the display on the lower right side.
	Switches on the APR650. Starts a reading attempt from the home screen. Enters menu items and confirms selections, and moves to the next field in Task Mode.
	Starts the Barcode Scanner from Home screen
	Switches off the APR650 on a long press (>2 seconds) *

Status	Action
	No function in home screen *
	No function in home screen *

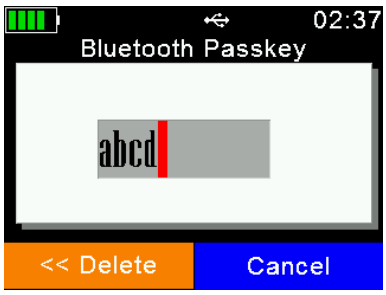
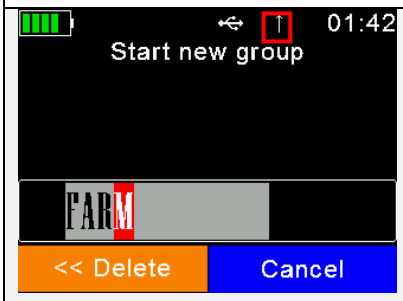
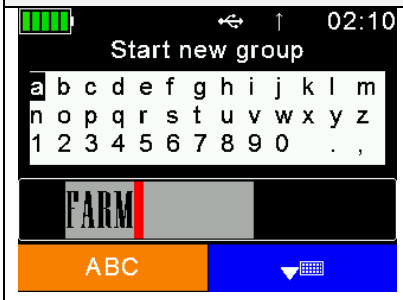
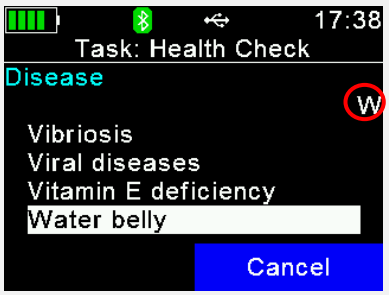
*The directional keys are also used to navigate within menus (up, down, left and right), for scrolling through selection lists and database fields and for selecting characters in numeric or text input fields.

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

4.3.1 Alphanumeric Entries

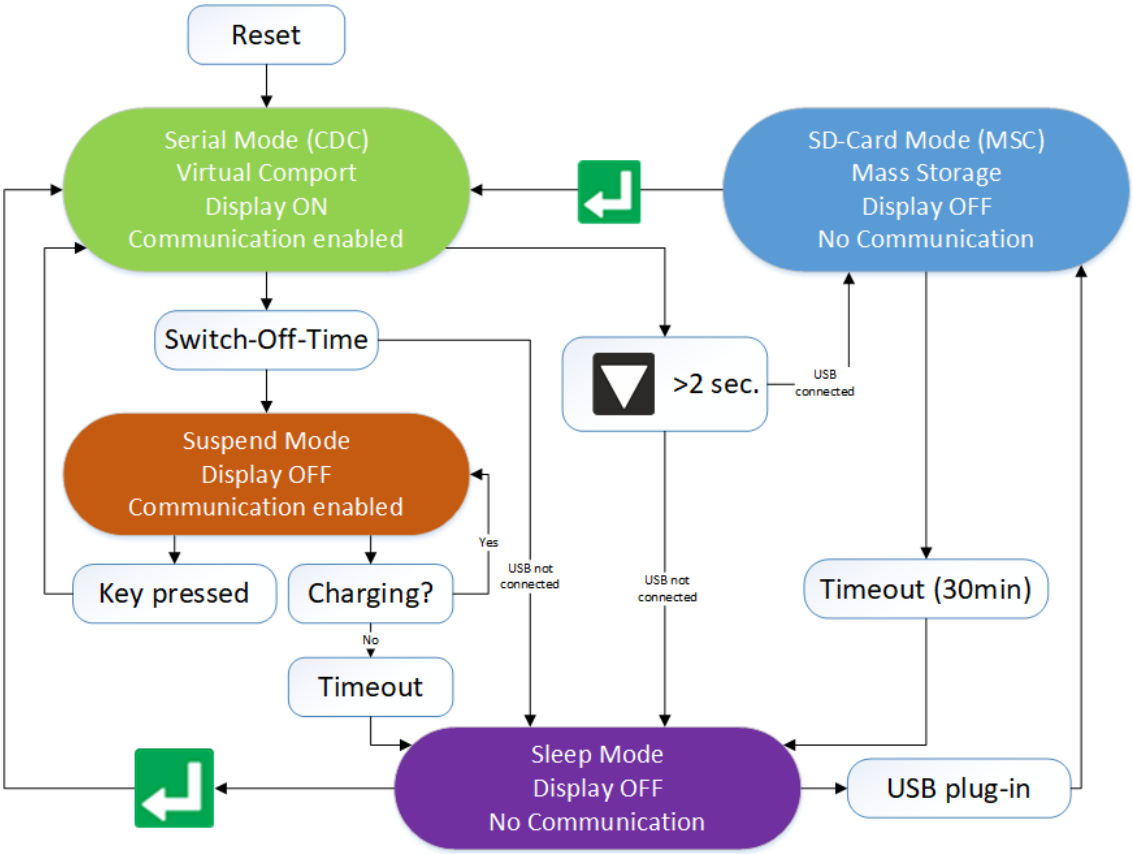
- The keys [1], [2], … [0] serve multiple functions.
- The first press on a key selects the large imprinted character, e.g. '*1*' or '*2*'.
- When the same key is pressed again within one second, the first small imprinted character will be selected in lower case, e.g. '*a*' or '*d*'.
- Another keystroke 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 shows some keyboard usage examples:

Screen	Details
	Beside the usage of the alphanumeric keys, it is possible to change the character of the 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 Data-Base-Function, 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 APR650 has several operating states related to display status and communication possibilities over USB. The following chart shows the different states.

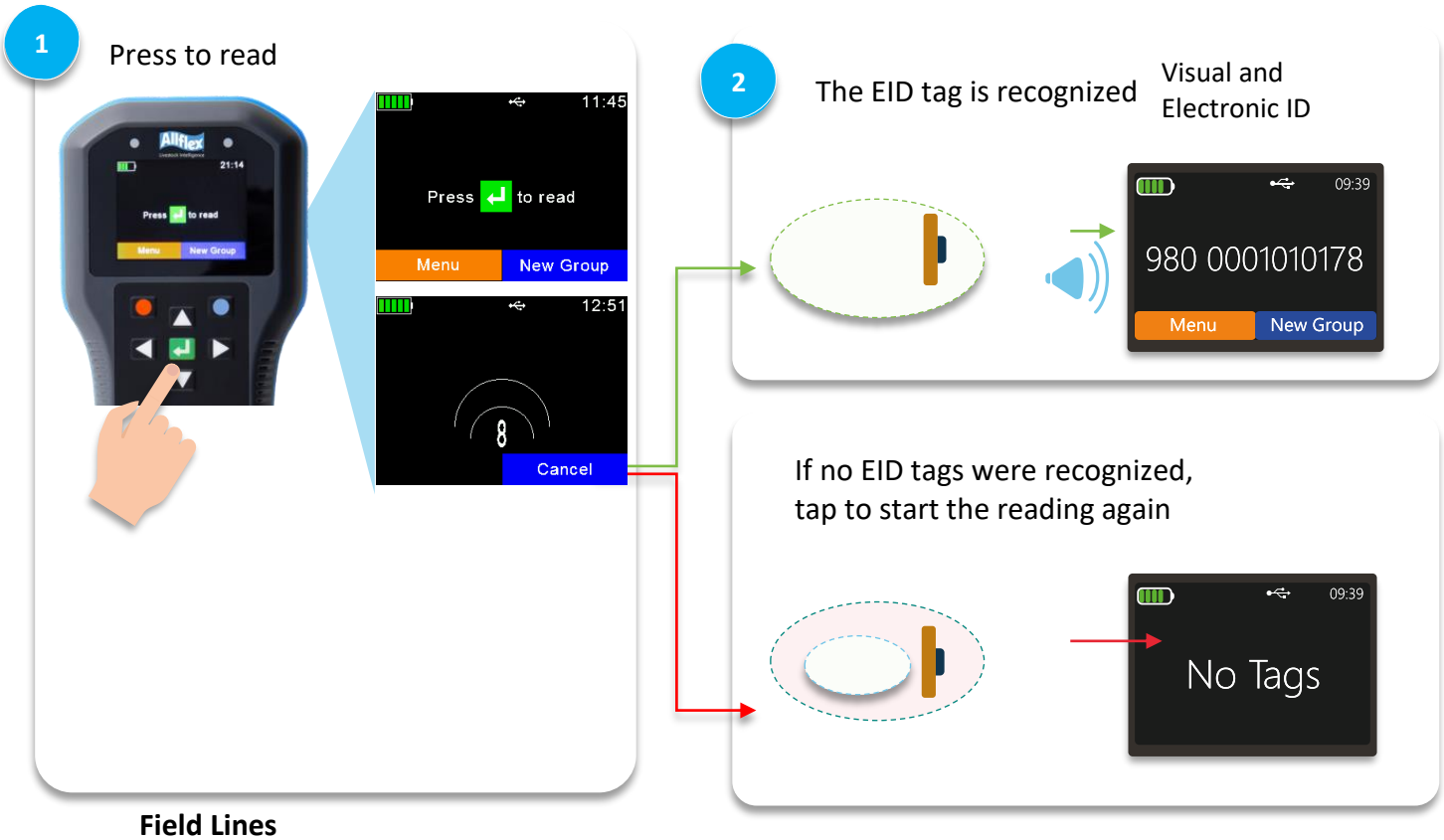


When the reader is switched on and it is connected via USB, it works in *CDC-Mode*. That means a virtual comport is created on the computer and it is possible to send commands to the device via a serial port connection. In this state the mass storage mode is not activated, it is not possible to copy files to or from the APR650.

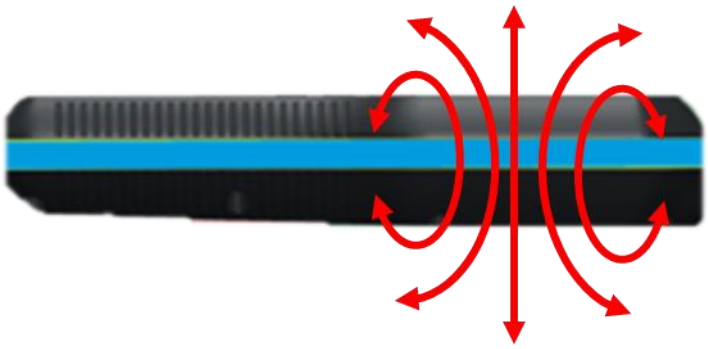
After the configurable switch-off-time (default = 60 seconds) has elapsed, the reader enters *Suspend-Mode* when a USB cable is connected. The display is switched off, but communication is still possible. In this state the blue LED on the right above the display is flashing in cycles of one second. The device will not enter sleep mode if 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.

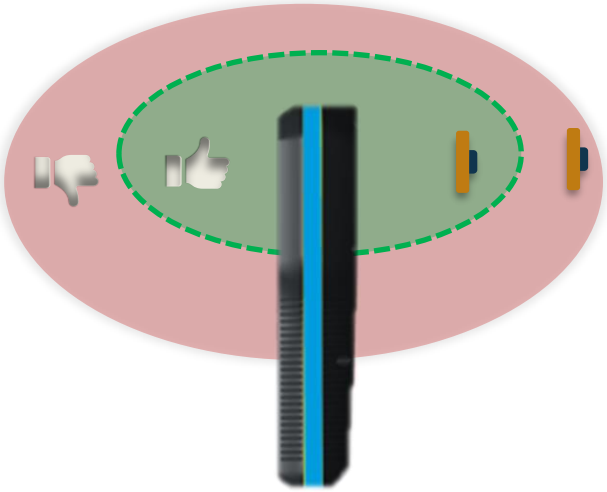
If the APR650 is connected to USB while it is switched off, the MSC mode is activated. Then the reader is attached to the computer as a mass storage device and file transfer is possible. Once the ↵ key is pressed, the device will switch on and use *CDC-Mode* right away. When pressing ▼ for at least two seconds while USB is connected, the APR650 will enter *SD-Card Mode* as well.

6 Reading EID Tags

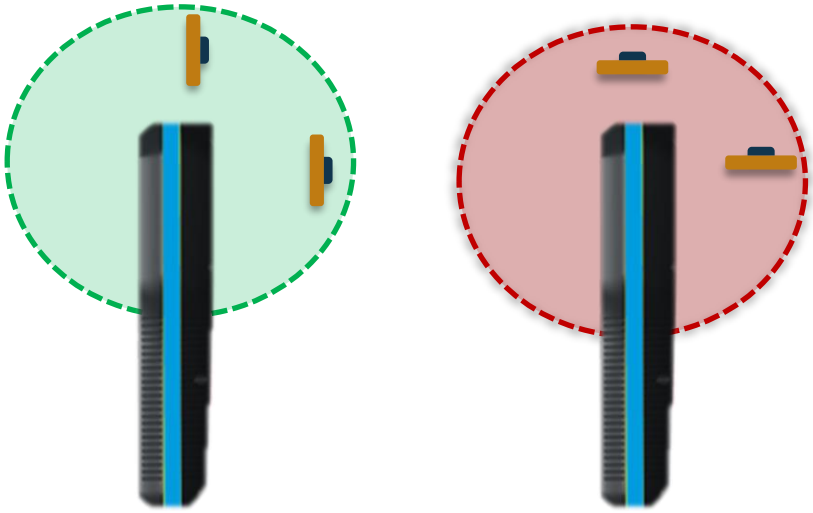


Field Lines

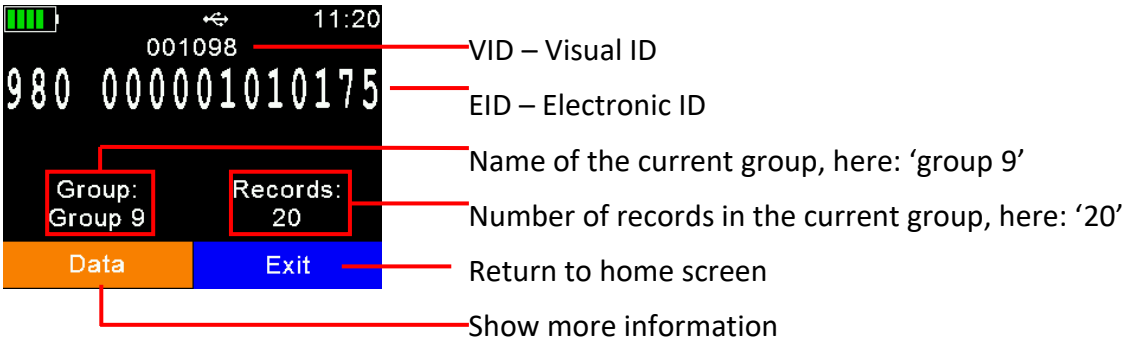


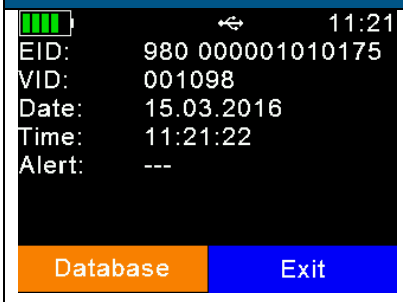
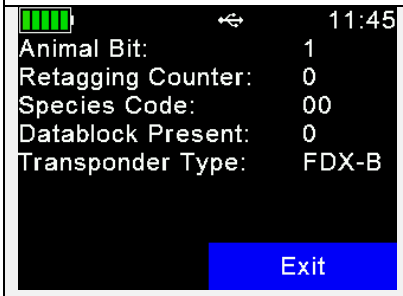


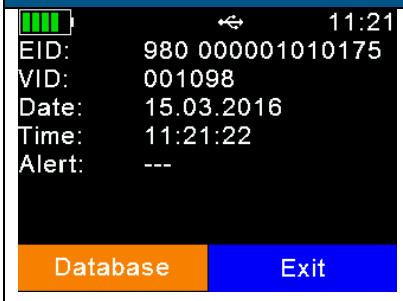
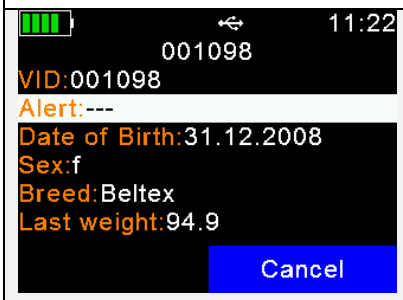
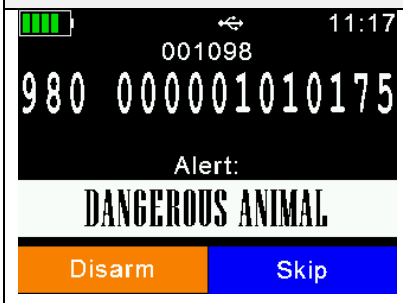
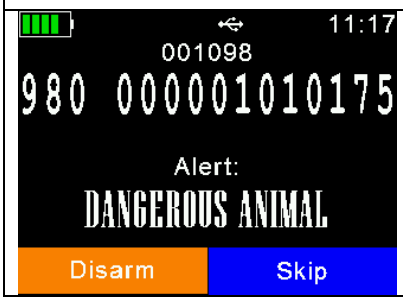
Optimal Reading Orientation **Not Recommended**



When an EID tag is read, the following information appears:

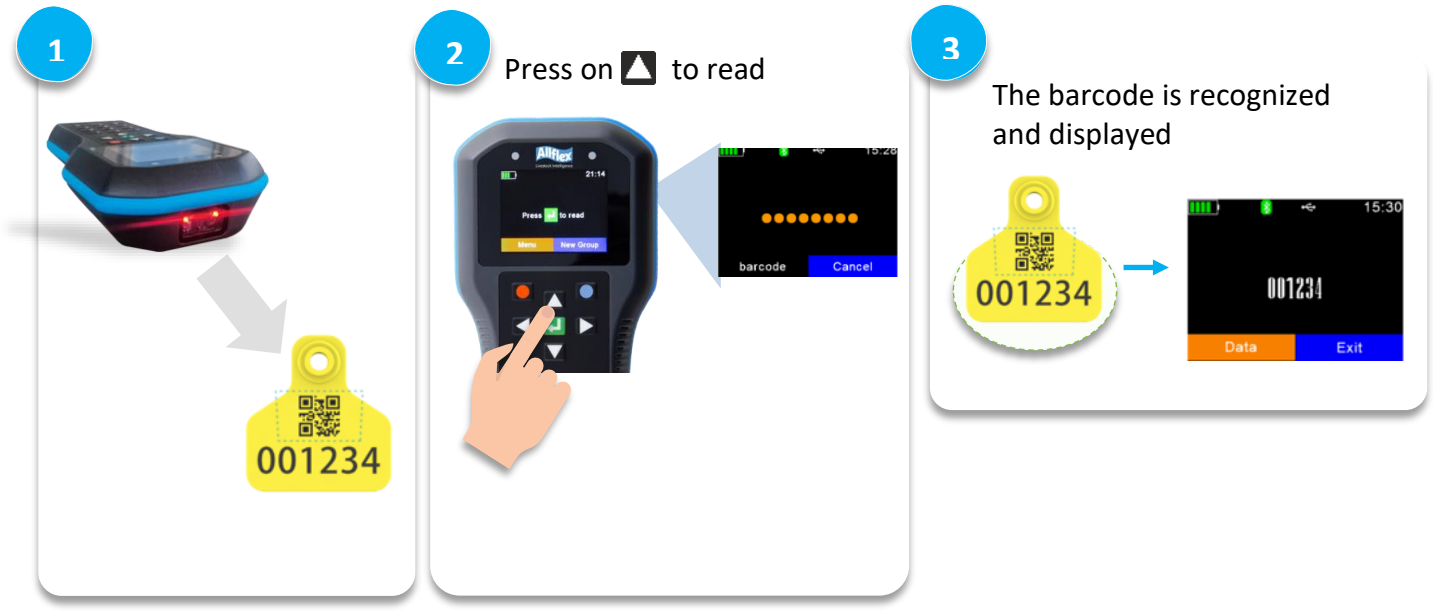


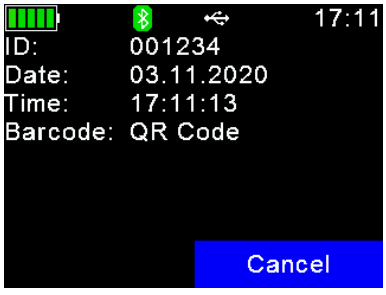
Screen	Details
	This screen is displayed when Data is pressed. It provides information about the EID, VID (if available), Date and Time of reading and the Alert text (if there is one for this EID tag).
	This screen displays when ▼ or ▲ is pressed. It indicates the EID tag type (FDX or HDX) and displays the so called 'advanced ISO information'. You can move from one screen to the other by pressing any of these keys.

Screen	Details
	If a Database-Record is available for this EID tag, you can view the Database information by pressing the left soft key.
	This picture shows the Database entries. The fields depend on the definition of the Database. You can also edit fields by selecting them and pressing ↵ if they have been defined for editing in the Database definition. All other fields cannot be selected.
 	If an alert is present for the EID tag just read, the alert text is displayed continuously, with the color inverting and an alert sounding. The alert can be disarmed (not shown again after next reading of this EID tag) or it can be skipped.

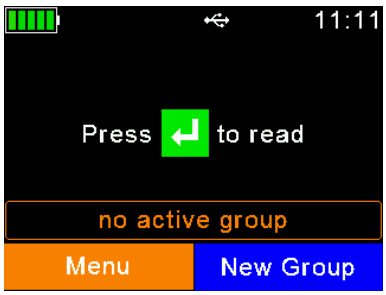
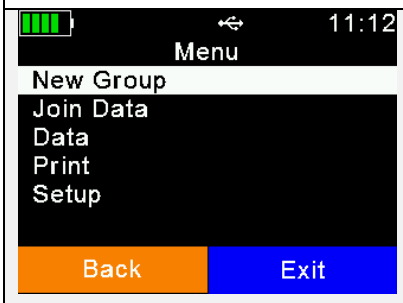
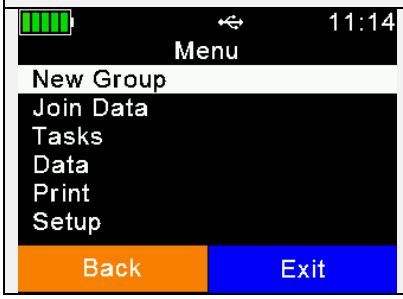
7 Barcode Reading

The Barcode scanner can be started by pressing the ▲ button from the home screen. Scanning is active for a maximum of 10 seconds and an animation is shown on the display during this period. The scanner projects a blue aiming help which should be placed over the Barcode for a successful reading session. Once the Barcode is scanned, the device displays the code on the screen.



Screen	Details
	Once the Barcode is scanned, the details can be viewed by pressing ● when the Barcode content is shown. In this case the ID is '001234' and the type is 'QR Code'. The APR650 creates a new record in the selected group with no EID but with the Barcode.

8 Menu Items

Screen	Details
	Press ● in the home screen to access the APR650 menu.
	This screenshot shows the highest menu level. It contains the items '*New Group*', 'Join *Data*', '*Data*', '*Print*' and '*Setup*'. If other language is selected, the menu items are displayed 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 APR650 that allows the collection of comprehensive data. For further information about this operating mode, contact your local distributor.

Use all available keys to navigate through the different menus. The directional keys have the following functions:

Screen	Details
	Enters the next submenu or performs 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 forces the device to move one menu level upwards and the right one (blue) returns the reader to the home screen. In the lowest submenu, the right soft key cancels the action.

8.1 Menu Structure

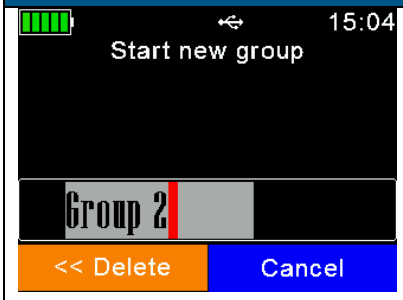
The following table shows the menu structure for the APR650, including submenus and options. Options or actions are shown in *italic* and the default values for options are marked with ' * '.

Main Menu	*1st sub menu*	*2nd submenu*	*3rd submenu*	*4th submenu*
New Group	*Start new group*			
Join Data	*EID + VID*			
	EID + Weight			
	EID + Barcode			
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		

8.2 New Group

Records in the APR650 memory are organized in groups. One group can contain up to 10,000 records. A new record is created for every EID tag that is read. If you do not wish to create new records for duplicate reads, enable the '*Animal Counter*' so that duplicate records are not saved in the same group.

Screen	Details
	After selecting 'New Group', you are prompted to enter a group name. You can accept the suggested name by pressing ↵ or delete it by pressing the left soft key character by character. A long press removes all digits in one step. Press ▲ or ▼ to open a soft keyboard.
	Use the ↵ key to navigate around the keyboard to enter the group name. Press the left soft key to switch keyboard content (capitals & special characters).
	When you have entered the group name, press the right soft key to exit the soft keyboard. Check and confirm the name by pressing ↵. All EID tags read from now are saved in this group (max. 10.000).

When a group reaches 10,000 records, the device forces you to create a new group, even if groups are not required for the application.

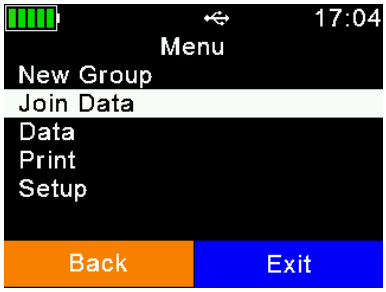
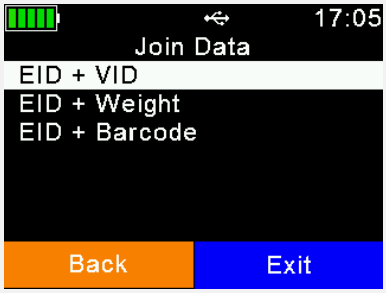
If no group has been created manually before the first EID tag is read, the device inserts a group with the default name '*Group 1*' automatically. If you want to change the name of the first group., you must create a group **before** scanning for EID tags.

8.3 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 APR650:

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

Screen	Details
	The Join Data menu is accessible via the second entry in the main menu:
	• EID + VID • EID + Weight • EID + Barcode

8.3.1 EID + VID

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

- Entering the VID with the keyboard
- Selecting 'free VID' from the Link-List
- Barcode scanning as the VID

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

8.3.2 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. Ensure that the scale settings are set correctly before trying to use this feature. The weight is saved as a record in the active group together with the EID.

8.3.3 EID + Barcode

EID + Barcode can be used for linking a Barcode on a blood- or tissue sample tube to an animal via its Electronic ID, for example. After the EID tag is read, the Barcode scanner is activated. If all data is confirmed, the EID-Barcode pair is saved in the internal memory as a record.

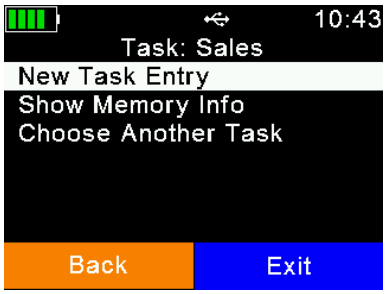
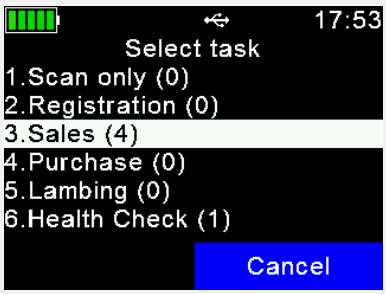
Refer to the *Join Data* Manual for mobile readers concerning all details for these additional functions.

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

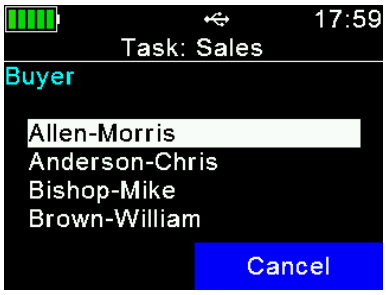
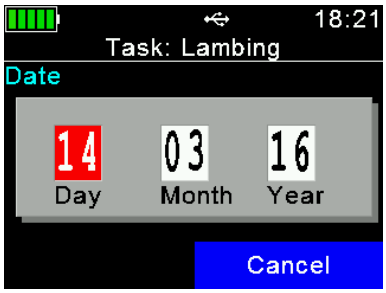
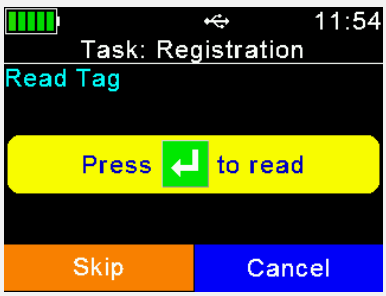
8.4 Tasks

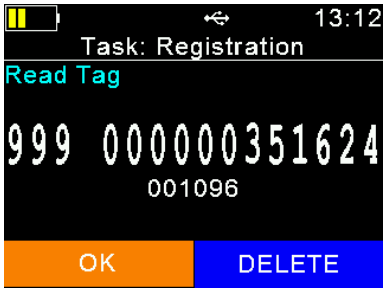
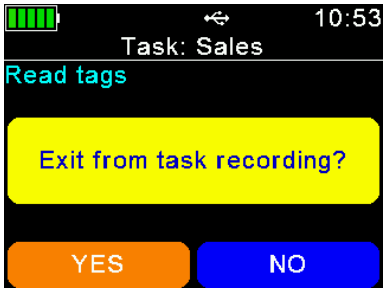
This submenu is only visible if Task-Definitions have been uploaded. Such definitions are usually very much dependent on the application and thus Allflex cannot provide them. They are normally created by distributors who also offer Management-Software that supports Allflex mobile readers. If no Task-Definitions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

If Task-Definitions are available on the APR650, this menu item is visible automatically. When entering the submenu 'Tasks', the following entries are shown:

Screen	Details
	**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 ↵.

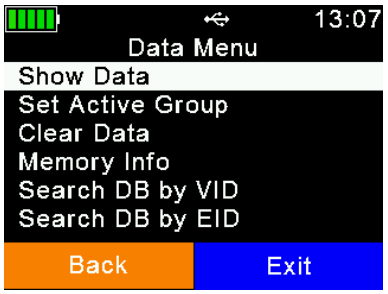
A new Task is started via 'New Task Entry'. Basically, the user can switch from one data field to the next one by simply pressing ↵ after the correct data have been inserted. The method for inserting data depends on the field types which are used in the Task-Definition. This manual provides some examples.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

Screen	Details
	This is a List - Field ▼ … One item down ▲ … One item up ▶ … Next page ◀ … Previous page ↵ … Select item
	This is a Numeric Input Field ▲ … Increase number ▼ … Decrease number ▶ … Next digit ◀ … Previous Digit ↵ … Confirm input
	This 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 APR650 starts scanning for an EID tag after ↵ has been pressed.

Screen	Details
	After an EID tag has been read successfully, the display shows the EID and asks 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 and the RFID reader is reading continuously until the right soft key ('Cancel') is pressed twice
	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 APR650 will return to the reading loop and more EID tags can be read.

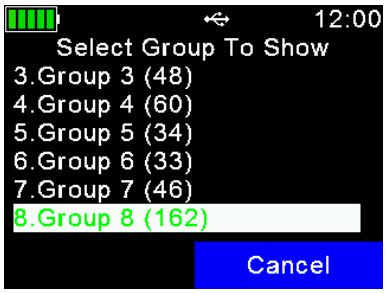
The sequence of a Task depends on the Task-Definition. In case there are 'logical' problems with the sequence, or the collected data contact your local distributor. Allflex is not responsible for such definitions.

8.5 Data

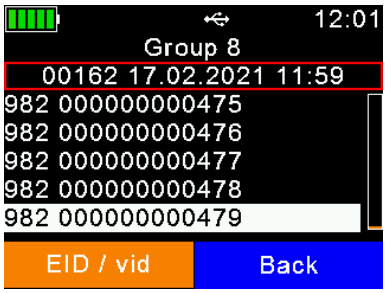
Screen	Details
	The 'Data' menu contains items for showing and deleting data, and for selecting the active group. It is also possible to search an uploaded Database for a particular entry based on either the input of the VID or an EID (read EID tag), but only if a Database has been uploaded. If this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

8.5.1 Show Data

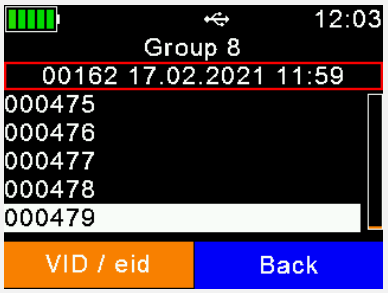
The device displays a list of all current groups. Each entry shows the group name and the number of records within the group in brackets. The active group is shown with a Green font.

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

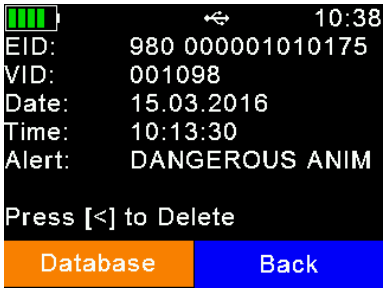
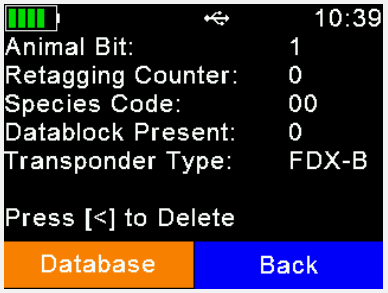
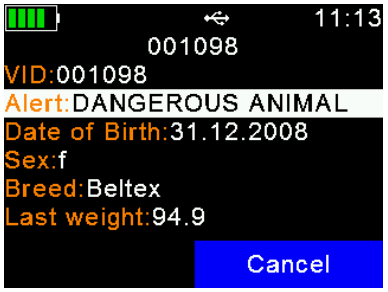
When a group is selected, it is opened and all records in the group display. The first display line shows the group name, here: '*Group 8*'. The second line shows the record number (within the current group) and date and time of reading for the selected record. A scroll bar on the right side shows the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

Screen	Details
	▼ … 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 shows the last record (the newest) within this group. Pressing ◀ + ▶ simultaneously, the reader switches to the first record in the group and when ◀ + ▶ are pressed again, the last record is presented again.

Screen	Details
	This example shows the same list but instead of the EID, the VID is shown. This is applicable only if VIDs are available on the device, i.e. a Linklist or a Database must be uploaded. If there is no VID available for records, the EIDs are shown.

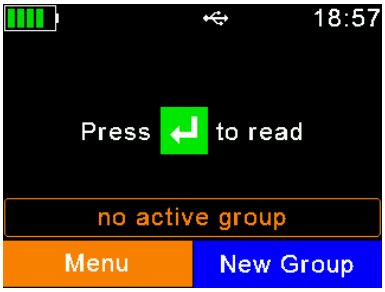
To show detailed information for a record, select an entry from the list and confirm with ↵. The details of the record are shown on two pages.

Screen	Details
	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) ↵ / ● … Return to list of records
	Page two shows the 'advanced ISO information' such as Animal Bit, Retagging Counter or Species Code. The EID 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, then Database does not display.
	You can also edit fields by selecting them and pressing ↵, if they can 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).

Screen	Details
	Example for a 2nd Database page ◀ / ▶ … Switch to next page ▼ / ▲ … Select next / previous (editable) Database field ↵ … open Database field (if defined to be editable)

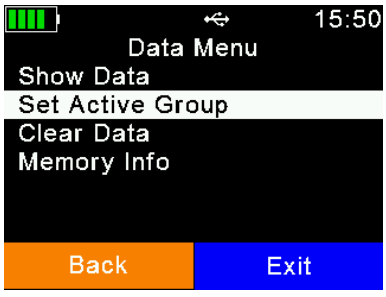
8.5.2 Set Active Group

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

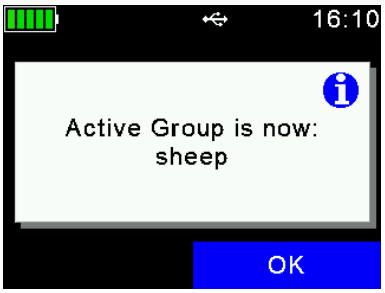


If no EID tags have been read yet, a message with the information 'no active group' is shown on the home screen.
When an EID tag is read, the device will automatically create a new group with the name 'Group 1'. For other group name, it is necessary to create a new group manually first before reading an EID tag – in this case the name can be modified.

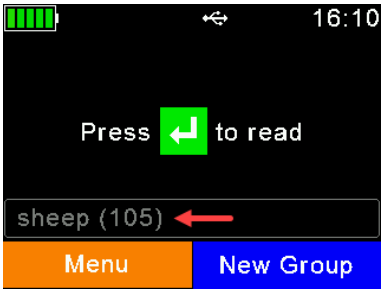
If you want to add new animals to an existing group, set this group as the active group. This can be achieved using the menu item Set Active Group in the Data Menu:



The currently selected group is shown in green.
Use the ▼ / ▲ keys in order 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 ↵ in order to make 'sheep' the active group.

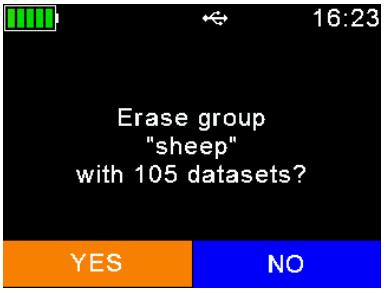


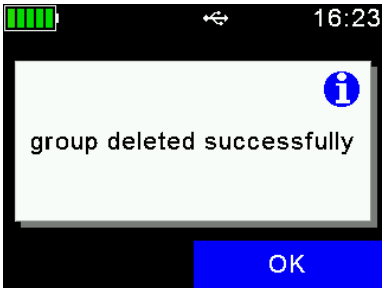
The reader shows a confirmation message with the information that the new active group is 'sheep'. All EID tags which are read from now on will be saved in this group until a different group will be set as the active one.



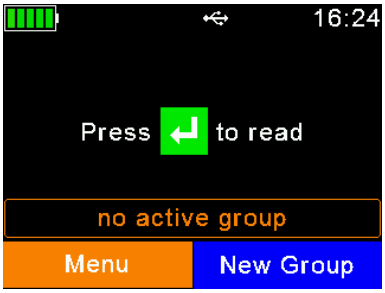
The name of the active group is shown on the home screen with the amount of records in that group in brackets. A maximum of 10.000 records can be saved in one group.

If the active group is deleted:





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

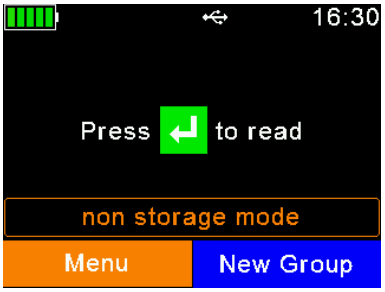


If a reading attempt is started in this case, the device will show the menu for selecting the active group from the list of existing groups:

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.

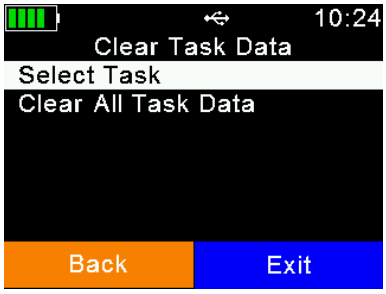
If the reader was configured to 'non storage mode', this will be indicated on the home screen:



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

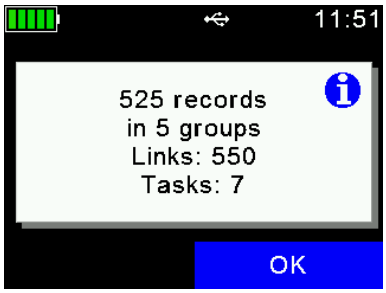
8.5.3 Clear Data

You can delete data from the APR650. There are various ways to delete data, depending on how that data was collected. The standard records are saved in groups. These are the records that have been saved after the EID tag reading starts from the home screen.

Screen	Details
	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
	• **Select Group**: opens the list of groups to select a particular group to delete • **Clear All Groups**: Erases ALL groups from the device memory
	**Select Task**: erases the data of one Task **Clear All Task Data**: erases the Task data of ALL Tasks

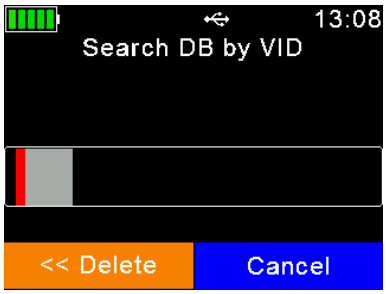
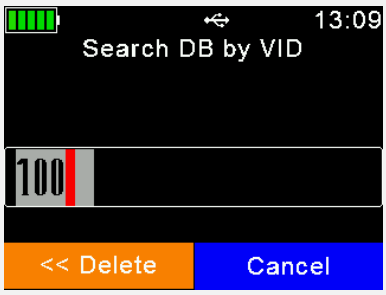
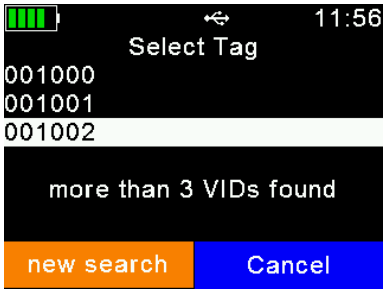
Data that is deleted is removed permanently. The action cannot be reversed. Before deleting, make sure you back up the data first.

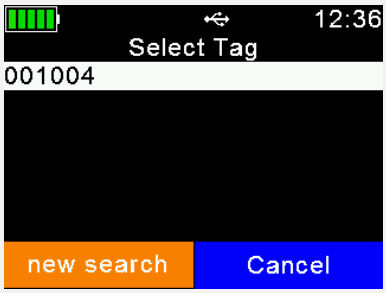
8.5.4 Memory Info

Screen	Details
	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.

8.5.5 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 EID 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.

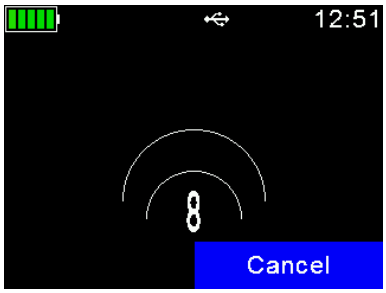
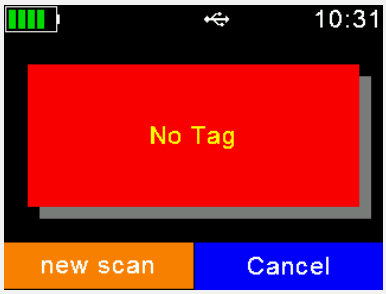
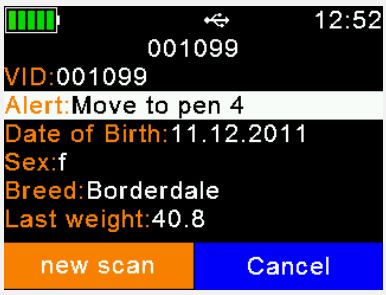
Screen	Details
	Use the ▼ / ▲ keys to change the character and the ◀ / ▶ keys to move to the previous / next digit. When browsing through the list of characters, you can hold the ▼ or ▲ key in order to increase the scrolling speed. Alternatively, the alphanumeric keys can be used for entering the VID to search for. Press ● in order 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 ● in order to narrow the search by entering more digits

Screen	Details
	Now there is only one matching item left. Press the ↵ key in order 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.

8.5.6 Search DB by EID

This menu item searches the Database for a matching entry based on the electronic ID. As soon as the EID tag is read, the APR650 will start looking up this number in the Database. Note that this menu item is only visible, if a Database has been uploaded.

	The APR650 starts scanning for an EID 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 an EID 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 EID tag was read but there is no match in the Database, 'Not in database' is shown.
	As soon as an EID 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 between reading EID tags from the home screen is that no record is created here – this is just a Database lookup.

8.6 Print

You can send the collected records from the APR650 to a mobile Bluetooth printer. Printing options include:

- Printing active group
- Printing a specific group
- Printing all groups

It is also possible to change basic printer settings here.

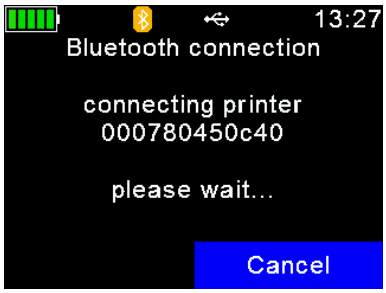
Ensure that your printer is set up correctly before trying to print records.

The APR650 stores the printer's Bluetooth address as a secondary address only. When there are no print jobs, the APR650 attempts to connect to its primary Bluetooth partner, such as a computer, smartphone, PDA or weighing indicator in Master Mode. When a print job begins, the reader drops the connection to the primary device and tries to connect to the configured Bluetooth printer.

After exiting the Print menu, the connection to the printer is terminated and the APR650 tries to re-connect to the configured primary Bluetooth partner again (if in Master Mode). This means that the user does not need to select a different Bluetooth device just for printing.

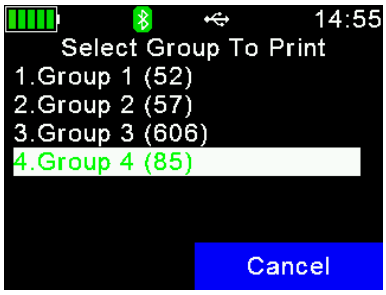
8.6.1 Print Active Group

Once selected, the APR650 tries to connect to the configured printer. If connected, this connection remains active until the '*Print*' menu is closed.

Screen	Details
	The screen shows the reader is trying to connect to the Bluetooth printer. When the connection is established, printing starts immediately. If there is a lot of data to be printed, a progress bar is visible. The APR650 returns to the printer menu afterwards.

8.6.2 Select Group

You can select a specific group to print the data, rather than the active one or all groups.

Screen	Details
	Select the group to be sent to the printer using the ▼ / ▲ keys and confirm with ↵. The active group appears with a Green font. If the Bluetooth connection has not been established yet, the APR650 tries to connect to the mobile printer. If the connection to the printer is established, printing will start right away.

When printing is finished, the reader returns to the screen shown above.

8.6.3 Print All Groups

You can select to print all the memory content; the procedure is similar to '*Print Active Group*'. No further selections are required.

8.6.4 Print Barcode

It is also possible to print the barcode of an EID. This is useful if you want to label blood samples, for example. To be able to print the EID as a barcode, the APR650 must read the EID tag first. When you select '*Print Barcode*', the device activates the RFID engine. After the EID tag has been read, the APR650 sends an appropriate command to the mobile printer.

Screen	Details
	The barcode type is '2of5 interleaved'. Other barcode types are not currently supported.

8.6.5 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 APR650 menu. So all the additional options are only software configurable. For example, SenseLink can be used for configuring all possible printer options.

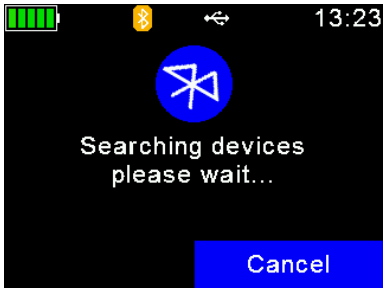
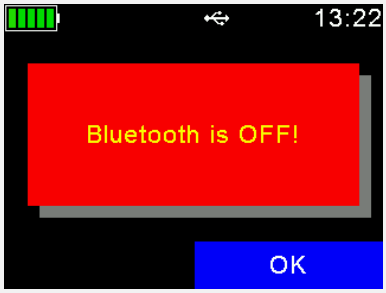
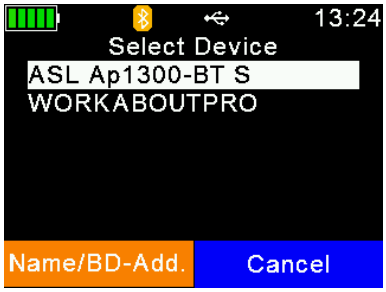
8.6.5.1 Set Printer Type

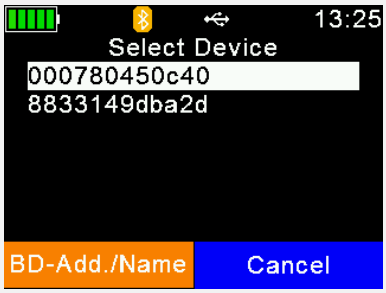
The APR650 Firmware supports various printer types, such as the Able Systems 'AP1300', the Datamax-O'Neil 'Apex' series (former Extech Apex), the Zebra QL-series and QLn-series and the Martel 'MCP 1880/7880'. The type '*Generic Line Printer*' might work for particular printers as well, but there are no special control codes sent for this printer type – so it can only work for simple ASCII printers.

Use the directional keys to select the correct printer type from the list and confirm by pressing the ↵ key.

8.6.5.2 Search BT Printer

Before you can start printing via Bluetooth, the APR650 must be paired with a printer. The reader scans for available Bluetooth devices first. The scan starts when this menu item is selected.

Screen	Details
	Depending on how many devices are present, the scan can take a while, but at least 10 seconds.
	If Bluetooth is switched off, the APR650 shows the corresponding error message. In this case, activate Bluetooth first (see chapter 8.7.3.3).
	After the scan has completed, the available devices are listed. Note that not only printers are listed here, but other Bluetooth devices also. Ideally, you should know the 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.

	A list of discovered devices with their BD-addresses instead of the device names displays. In some cases, 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 APR650 stores this device as the Bluetooth printer and attempts to connect to it for all scheduled print jobs until a different device is selected.

8.7 Setup

The APR650 is very flexible concerning its configuration. Several settings can be adjusted directly in the device menu. Special settings cannot be modified on the APR650 itself, but they are software-adjustable only.

A possible software for altering all possible APR650 settings is SenseLink. A setup of this program is located on the internal memory card.

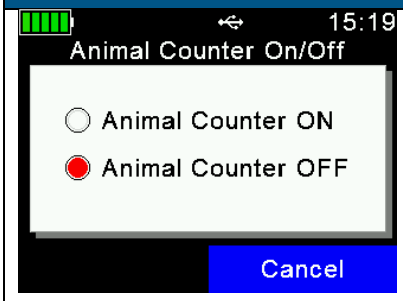
The Setup menu is divided into several menus and submenus.

8.7.1 Reader Settings

8.7.1.1 Animal Counter On/Off

The animal counter is used to determine if double-reads should be saved or not. A double read occurs if an EID tag with the same EID is read within the same group twice:

- If activated, an EID is not stored more than once in the same group
- If deactivated, an EID may be stored more than once in the same group. Deactivation enables double read of an EID.

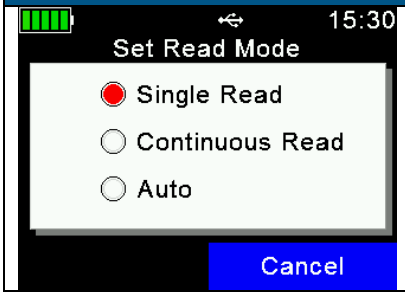
Screen	Details
	Decide whether the Animal Counter should be activated or not using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.

Screen	Details
	The display also looks different after reading an EID tag, depending on how this setting is configured: 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 EIDs.
	When the Animal Counter is activated, the display shows 'Animals' instead of 'Records' – duplicates are not possible here.

8.7.1.2 Set Read Mode

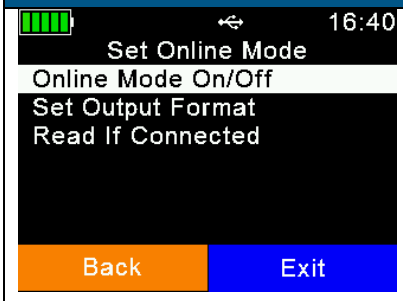
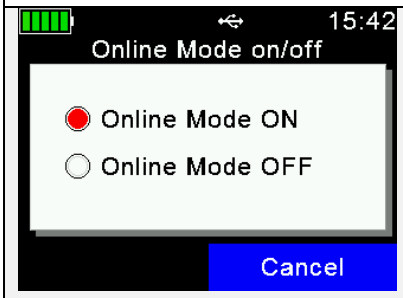
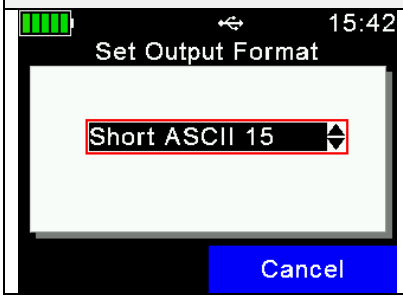
By default, the APR650 is configured to '*Single Read*'. This means that RFID is activated until an EID tag has been detected or the '*Single Read Time*' (default = 10 seconds) has elapsed. The ↵ key must be pressed to scan for EID tags again.

The APR650 also allows using the '*Continuous Read*' mode. The RFID engine will not be de-activated after an EID tag has been read. It continues scanning until the '*Continuous Read Time*' (default = 60 seconds) has elapsed. Every new EID tag read resets this timeout.

Screen	Details
	Select the Read Mode using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵. The 'Auto' setting starts a Single Read on a short press of ↵ and Continuous Read on a long press (> one second).

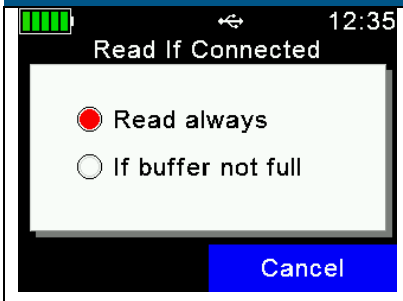
8.7.1.3 Set Online Mode

The Online Mode deals with the format used for sending the EID to the interfaces directly after an EID tag has been read. The interface can be USB, Bluetooth, or WLAN. Usually the EID is further processed on a third-party device such as 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.

Screen	Details
	After selecting 'Set Online Mode', a new menu appears. The first menu item enables activating or deactivating the Online Mode completely. The second determines the format used for sending the EID and the third deals with the setting for the transmission buffer.
	The Online Mode is switched on by default. When switched off, the APR650 will not send the EID to the interfaces after reading an EID tag! 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 sends 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 EID 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.

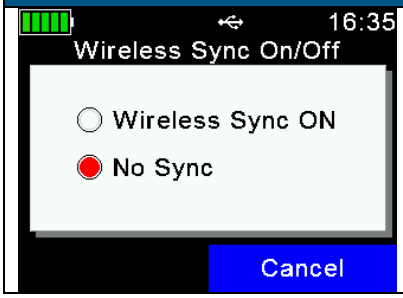
Screen	Details
	You can select not to allow further readings if the buffer is full. Per factory defaults this setting is not activated and reading is always possible. In case the buffer is full, the oldest records in the buffer will be overwritten. Select the desired setting using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.

8.7.1.4 Wireless Sync On/Off

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

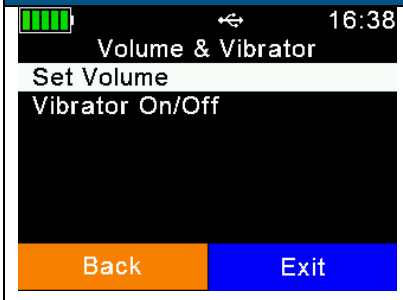
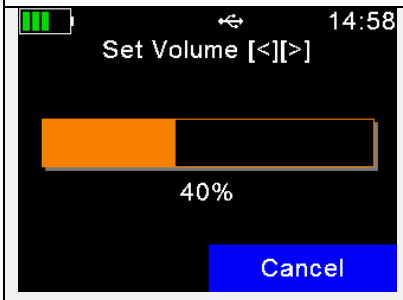
Since it is not possible to synchronize mobile readers wired in the field, Allflex readers offer a feature called '*Wireless Synchronization*'. This function enables mobile devices to operate close to stationary readers without interfering with them. In addition, several mobile readers can synchronize wirelessly.

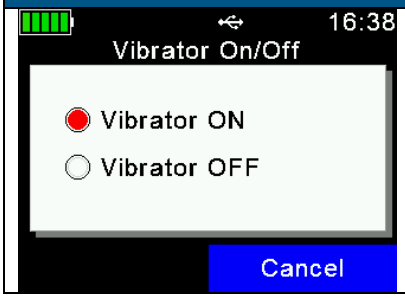
If you have other ISO11784/11785 readers operating close to the APR650, it is highly recommended to activate this function.

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

8.7.1.5 Volume and Vibrator

The APR650 provides a speaker and vibrations for alerts, in addition to the LEDs and the display. These can be configured in this menu:

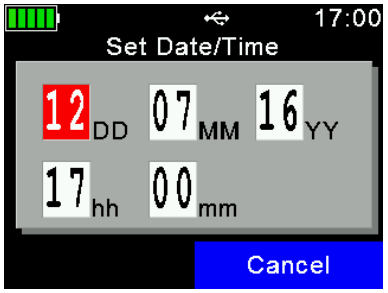
Screen	Details
	After selecting 'Volume & Vibrator', a new menu is shown. • The first menu item sets the speaker volume. • The second is used to activate the vibrations or deactivate it.
	Select the desired volume by using the ◀ / ▶ keys. Each time a key is pressed, a sound is played to indicate the currently selected volume. Confirm the selected volume with ↵.

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

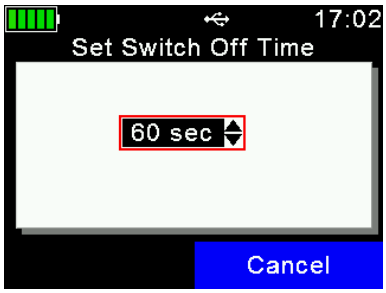
8.7.2 Display

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

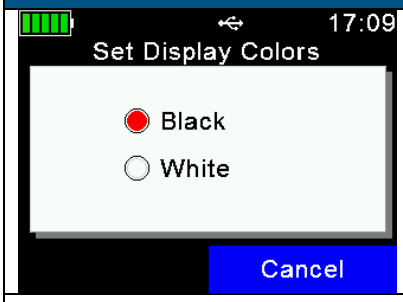
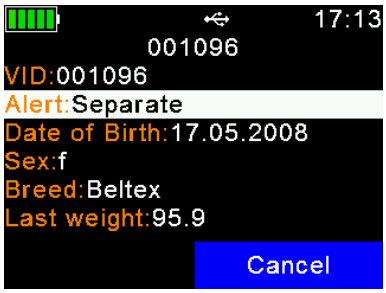
8.7.2.1 Set Date and Time

Screen	Details
	• 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

8.7.2.2 Set Switch Off Time

Screen	Details
	The 'Switch Off Time' determines after which period (of no action) the APR650 enters suspend mode. Any action, like a key press, will reset this timer. 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

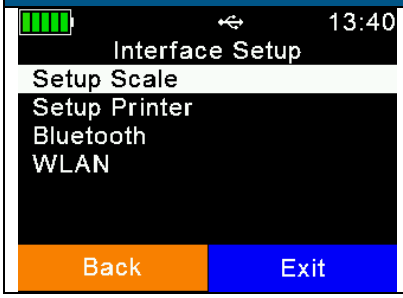
8.7.2.3 Set Display Colors

Screen	Details
	Depending on the light conditions, it may be necessary to invert the background color. It can also be a question of user preference. That can be done within this menu item. ▼ / ▲ / ◀ / ▶ … Change the setting ↵ … Apply the setting
  	

8.7.2.4 Set Language

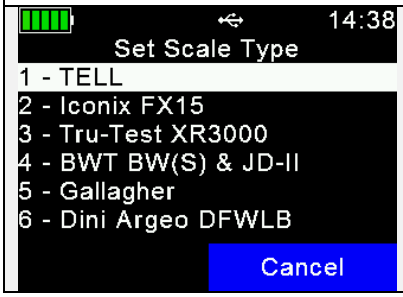
Screen	Details
	The default display language is always English. It is possible to upload up to 29 custom languages. If your language is not available contact your local distributor for further details. ▼ / ▲ … Select the desired language ↵ … Set the selected language

8.7.3 Interface Setup

Screen	Details
	The Interface Setup contains several settings for setting up the interfaces, Bluetooth or WLAN. Setting up interfaces with a Walk-on Scale and Printer are included here as well.

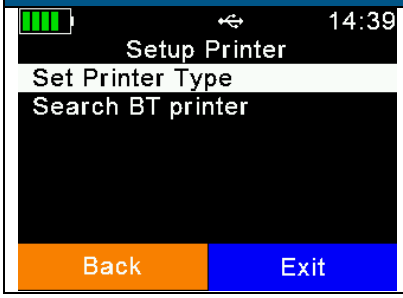
8.7.3.1 Setup Scale

The APR650 can receive the weight from indicators that can send it via Bluetooth. There are different scale types supported, including some major brands on the market. This function can be used with 'Join Data' (EID + Weight) or with *Task-Mode* and the ***D**ata-**B**ase-**F**unction*, where the '*Weight-from-Scale*' field is available.

Screen	Details
	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.

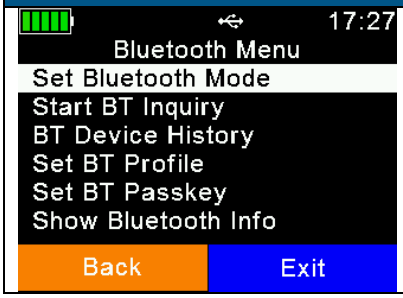
8.7.3.2 Setup Printer

Screen	Details
	The printer setup is the same as described in Setup Printer on page 35, This is another menu entry for configuring the same settings.

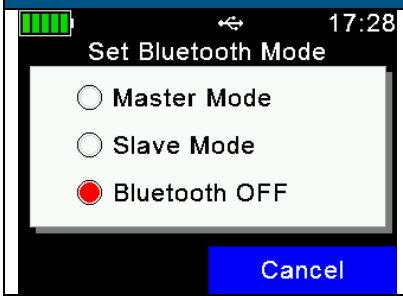
8.7.3.3 Bluetooth

The APR650 incorporates a Class1 Bluetooth module. The range is up to 80 meters in 'line of sight'. When inside buildings or when any other obstacles are present, the range is lower. Note that the range also depends on the Bluetooth partner. If the other device is only Class2, the range is much lower. This applies particularly to devices like smart phones.

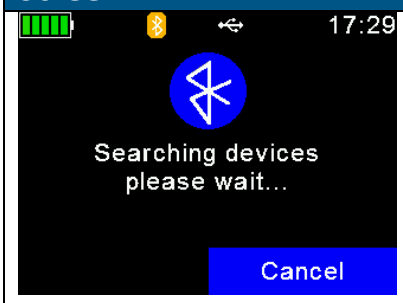
The Bluetooth menus and configuration are explained here.

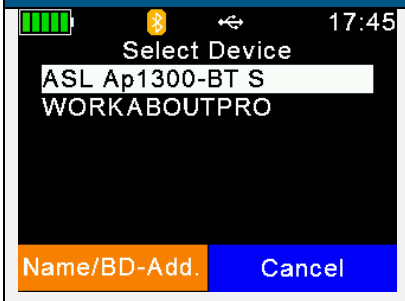
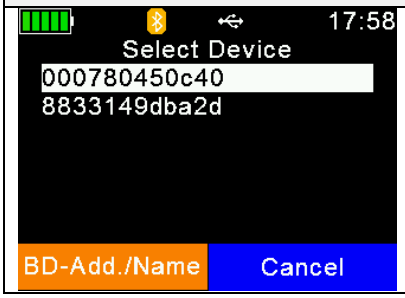
Screen	Details
	▼ / ▲ … One item down / up ◀ / ▶ … Switch to first / last item ↵ … Enter submenu resp. start action (BT Inquiry)

Bluetooth Mode determines if the APR650 initiates a connection to another device (Master Mode) or if other devices can connect to the APR650. By default, Bluetooth is not activated (OFF), so it must be switched on first. Then you need to decide whether the APR650 should be the device initiating the connection (Master) or the other device (Slave).

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

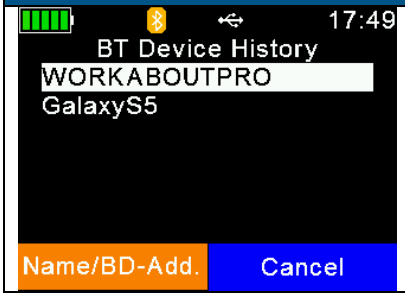
When the APR650 is in Master Mode, it needs to know the address of the intended Bluetooth partner, also called 'remote device'. An easy way to find out this address is to scan for Bluetooth devices in range. Make sure the other device has Bluetooth activated and is 'discoverable' and 'connectable' and 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 ↵.

Screen	Details
	The APR650 starts scanning for other Bluetooth devices in range. This can take at least 10 seconds, depending on how many devices are found.

Screen	Details
	The discovered devices are listed after the scan, sorted according to their names. To see the BD-address of the devices found instead of the names, you can switch between views by using the ● key.
	Here you can see the list of discovered devices with their BD-addresses rather than 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 APR650 stores this device as the Bluetooth partner and attempts to connect to it automatically and permanently, if the reader is configured to Master Mode.

Most applications will not have many different Bluetooth devices connected to the APR650. 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 known devices is not required.

Screen	Details
	Choose a device from the history to change the Bluetooth partner. The APR650 then uses this device as remote device until further changes. ▼ / ▲ … Select a device from the history ↵ … Set the device as the new remote device

The APR650 supports five different Bluetooth profiles:

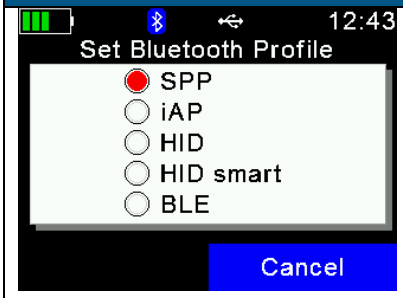
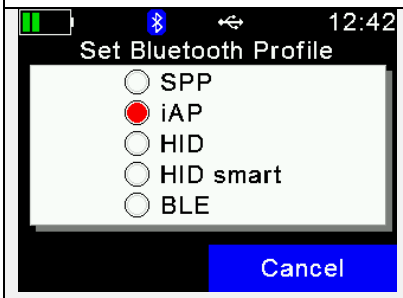
Serial Port Profile (*SPP)* emulates a serial cable to provide a simple replacement for RS232 connections. Commands can be sent into both directions – it uses virtual serial ports.

iPOD Accessory Protocol Profile (iAP): Allows serial communication with the iOS devices

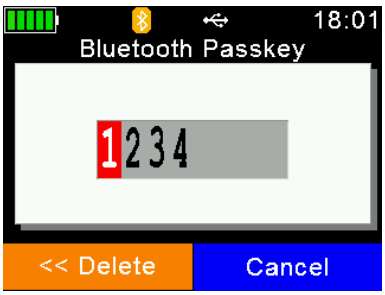
Human Interface Device (HID) is used for 'typing in' the EID sent via Bluetooth into text fields of applications running on the host device. This removes the need to develop a serial interface for the reader. The APR650 is connected to the host as a 'virtual keyboard'. When the cursor is in a text field in the app running on the host, the EID is entered in this field after an EID tag has been read. Note that it is not possible to send commands to the APR650 in HID mode – communication only works into one direction.

HID smart: This is the same as HID but the connection to the other device is only established after an EID tag has been read. This is required for the use with Apple devices because if a Bluetooth device is connected as HID keyboard, the on-screen keyboard is not available.

Bluetooth Low Energy (*BLE)* is currently reserved for special applications.

Screen	Details
	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, select 'iAP' instead of 'SPP' because when 'SPP' is selected, the APR650 cannot connect to an Apple device.

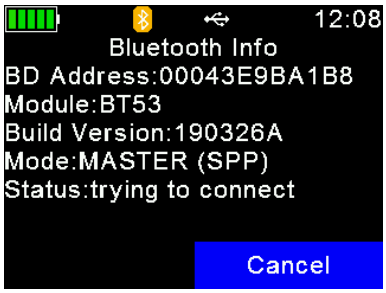
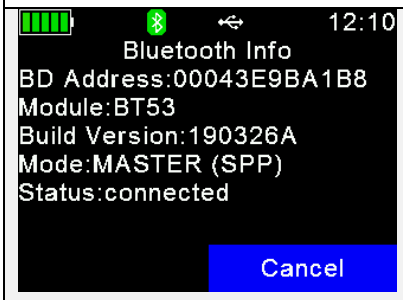
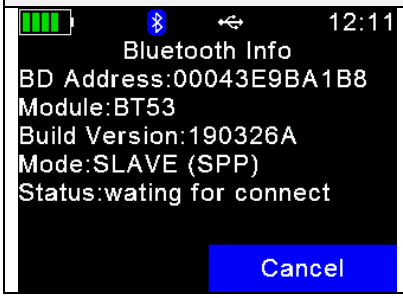
To allow a successful Bluetooth connection, the passkeys on both devices must match, otherwise the connection cannot be established.

Screen	Details
	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 in order 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.

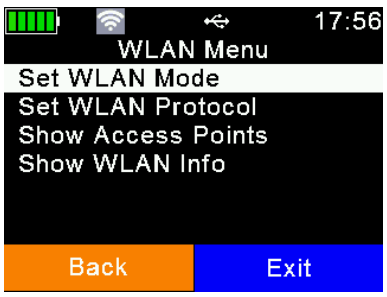
The menu item '*Bluetooth Info*' shows:

- Bluetooth hardware and firmware related information
- The configured Bluetooth Mode & Profile
- The connection status

Details concerning the color of the Bluetooth symbol depending on the connection status are explained in Bluetooth Status on page 7.

Screen	Details
	• **BD Address**: Bluetooth Device Address of the APR650s Bluetooth module, unique worldwide. • **Module**: Bluetooth model, built into the reader; here: 'BT53'. • **Build Version**: APR650s 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 APR650 is connected to the remote device. If the connection is lost, the reader attempts to reconnect to the configured Bluetooth partner until it successful. This is done automatically.
	Here the APR650 is configured to be the Bluetooth Slave. It is discoverable by other devices and it is connectable. The reader does not try to connect to a remote device in this configuration but waits for incoming connections.

8.7.3.4 WLAN



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 Senselink.

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 must be switched on. There are two possible operating modes available, 'Station' and 'Access Point'.

Station: This operating mode for WLAN is 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 (Service Set Identifier) which makes it discoverable and connectable – one could also call it 'network name'. The SSID must be configured correctly via software (like Senselink), it has to match with the SSID used by the Access Point.

Usually WLAN connections use security mechanisms like 'authentication'. The APR650s 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 must match with the one set for the APR650. Note that the passphrase is also case-sensitive!

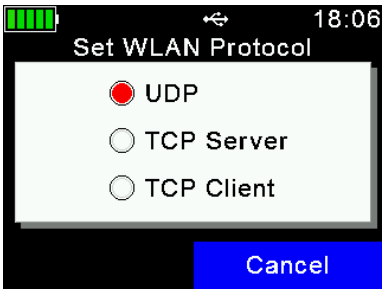
The easiest way for allowing the APR650 to join the Access Point is to let the Access Point work as a DHCP server. This means that IP addresses are assigned automatically.

If all those settings are configured correctly, the APR650 should be able to join the Access Point.

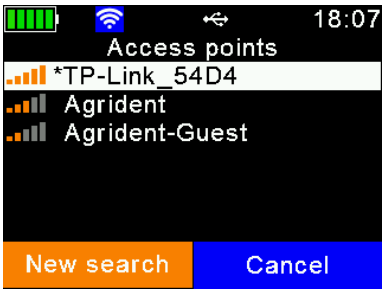
Access Point: When the APR650 is configured to 'Access Point' it will not try to join another Access Point, but it will create an own one. This is comparable with the 'mobile hotspot' function on smartphones even though the APR650 has no internet access, of course.

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

When the APR650 joined an Access Point or another device has joined the APR650 (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!

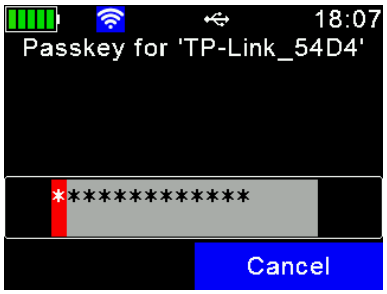


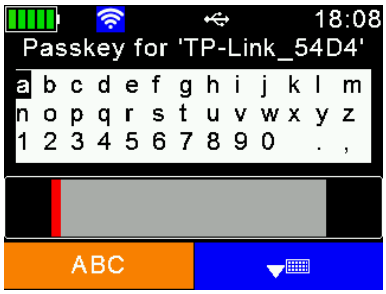
Choose the correct WLAN Protocol (depending on your application) using the ▼ / ▲ / ◀ / ▶ keys and confirm with ↵.



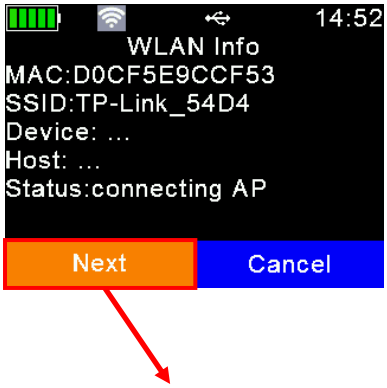
The menu item ‘Show Access Points’ is only visible if WLAN is enabled and set to ‘Station’ Mode. It is listing the currently available Access Points plus a signal strength indication. You may also connect to an Access Point from here by pressing ↵.

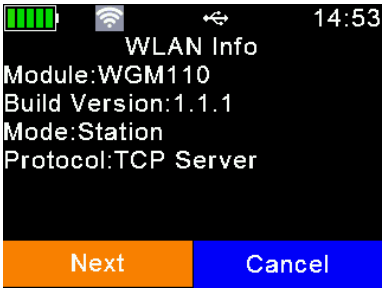
In case the Access Point uses WPA2 security, you are prompted to enter the passphrase. In order to change it, press any of the ▼ / ▲ / ◀ / ▶ keys. A virtual keyboard opens where the passphrase can be typed in.





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 is found at 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 APR650 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 APR650, 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 APR650 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 APR650 has joined the configured Access Point (WLAN symbol turned into blue) and the Status has changed to 'waiting for connect'.

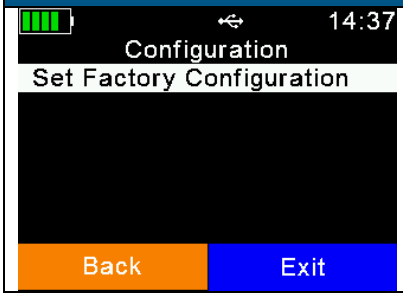
Device shows the IP address (192.168.0.104) of the APR650 plus the configured port (2010).

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 APR650 using IP address '192.168.0.104' and port '2010'.

8.7.4 Configuration

Screen	Details
	After selecting 'Configuration', this menu is displayed.

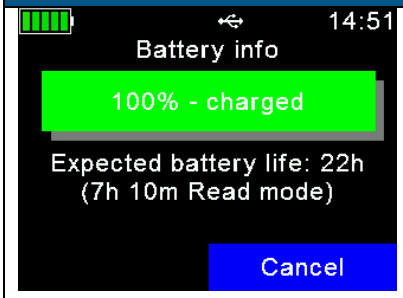
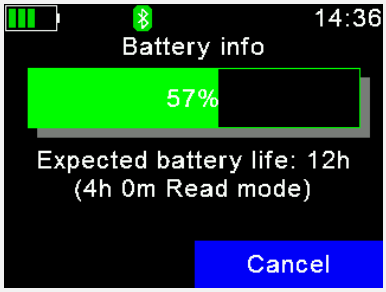
8.7.4.1 Set Factory Configuration

Screen	Details
	'Set Factory Configuration' resets all settings back to default values. This may be useful if specific settings have been changed and the APR650 is not operating as intended. Note this action cannot be undone. …confirm reset … abort reset

8.7.5 Device Info

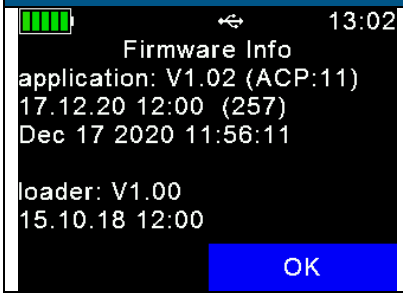
Screen	Details
	The Device Info menu includes information about the current battery status, the APR650 firmware and some information on the hardware.

8.7.5.1 Show Battery Info

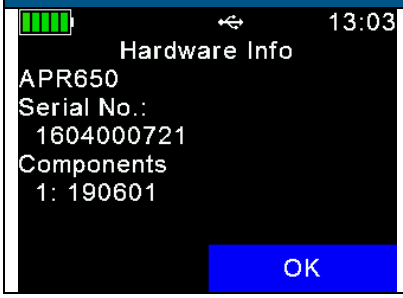
Screen	Details
	When fully charged, the battery info shows ‘100%’. Below the charging indication are estimates concerning the remaining operating time in standby mode (APR650 running but RFID engine is off), here 22 hours, and in continuous read mode, here 7 hours and 10 minutes.
	In this example the 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 also activated in this example; this is also included into the calculations. So the shown expected battery life considers all electric consumers that are currently active.

The details concerning the batter symbol in the status bar are explained in chapter 4.1.2.1.

8.7.5.2 Show Firmware Info

Screen	Details
	This screen displays the reader’s firmware version and additional information such as build date and bootloader version. You should have this information available when contacting support.

8.7.5.3 Show Hardware Info

Screen	Details
	This screen shows the reader's serial number and revisions of printed circuit board that is built into the device. You should have this information available when contacting support.

8.7.5.4 Noise & Timing Monitor

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

Appendix A: Battery Precautions

There are important things to consider concerning the rechargeable battery pack:

- Permitted 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 a long storage period, the battery should have a charging state of 30-70% for preventing a permanent loss of capacity.
- The battery must be stored 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 store the battery near heat sources, nor in a place subject to direct sunlight to storage in warehouse.

Using the Battery

- Misuse of the battery may cause it 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.

Charging the Battery

- 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 Allflex.
    - 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.

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.

Disposing of the Battery

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

Appendix B: Safety and Care

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

- The APR650 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, ensure to comply with the environment conditions specified in the technical data.
- Clean the APR650 Reader only with a damp cloth. Use only water and any commercially available cleaning agent.

Any modification to the APR650 Reader Electronic will render the warranty null and void.

Appendix C Warranty

The manufacturer of the APR650 Reader Electronic provides 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.
4. The damage is due to force majeure, for example lightning strike.
5. The damage is due to wear, resulting from overstressing mechanical parts.

Appendix D: International Approvals

CE Marking

Hereby, Allflex declares that the APR650, 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.

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.

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.

Troubleshooting

In case of any issue please contact your local distributor.