Operating and Installation Instructions

for

3739 v-link

Table of contents

Table of contents 2
Intended use 4
Conformity 4
Protective measures 4
Maintenance and care 4
Manufacturer 5
Disposal 6
Variants 6
Links 6
Introduction 7
Installation 7
Connecting the v-link box to the app for the first time 7
Operating the App 8
Main menu 8
Status bar 8
Read machine 10
Further processing of the readouts 11
Expert configuration 12
Configure machine 13
Software Update 14
Software update via the v-link button 14
Software updates for the v-link 14
Show data 15
System Information 16
Additional settings 16
Configuration 16
Search BT device 18
LED Info 19
About v-link 19
Directory structure 19
Transmission of readings to telemetry server 19

LED codes of the v-Link-Box 20
Operation of the box 21
Button 21
Operating Modes 21
Charging 22

General information

These instructions apply to all versions of the 3739 *v-link* product. Variant-dependent differences are shown in the text.

Read these operating instructions carefully before commissioning and keep them in a safe place.

The permissible operating temperature is -20 to +60°C, the permissible storage temperature -20 to +20°C.

The operating distance is 30 - 80 cm, the maximum reading distance 150 cm.

The device contains a lithium polymer accumulator and must be disposed of as electrical waste.

Opening the *v-link box* voids the warranty.

Intended use

v-link is a communication solution for vending machines and shall only be used in this environment.

The correct function of *the v-link* box can only be guaranteed by mikrolab for the vending machine interfaces listed in the whitelist (see Links). In case of problems with non-listed machine interfaces, mikrolab can offer support, for example in the form of software updates.

The correct functioning of the *v-link app* can only be guaranteed by mikrolab for the mobile devices listed in the whitelist (see Links). In case of problems with non-listed mobile devices, mikrolab can offer support, for example in the form of software updates.

Conformity

The *v-link* has an EC declaration of conformity in accordance with the directives of the European Parliament and the Council of the European Union. It complies with the CE standard and Bluetooth 2.1 specifications.

Protective measures

The *v-link* may only be operated after reading the operating instructions and by qualified personnel. It is not intended to open the device for repair.

Maintenance and care

The *v-link* does not require maintenance. The app checks regularly if a new version is available and updates itself automatically. The box can be cleaned externally with a damp cloth.

Scope of delivery

- v-link box
- carrying strap
- Qi charging station with USB cable
- quick start guide
- instruction manual

To use the v-link you need the *v-link app*. This app can be downloaded free of charge from the Android App-Store (search for "v-link", or use the adjacent QR-Code); please refer to the whitelist (see chapter Links). An iOS version of the app is not available.

Accessories

The following accessories for the v-link can be ordered separately:

Item	Number	Description
Adapter cable TRS (audio jack)	3739.10010	Required for communication via a TRS/jack interface (usually DEX)
Adapter cable Printer	3739.3	Required for reading a printer interface
Converter cable TRS->TRS	3139.32000 / 3139.32100	Changes Tx and Rx cable. Required for communication with DIVA devices. 32000 has a straight plug, 32100 a 90° plug.

Further accessories can be provided by mikrolab on request.

Manufacturer

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Disposal

For environmentally friendly disposal of the *v-link box*, its battery must be disposed of separately. To do this, open the box and remove the battery. Since opening the v-link box will void the warranty this should only be done to dispose of the device.

Variants

The *v-link box* is available in two hardware versions:

3739-01000.01 and 3739-01000.02, , which differ only in the printing on the housing.

Functionally, the two variants are identical.

Links

Further documents and firmware versions of the v-link on the homepage of mikrolab: http://www.mikrolab.com/de/produkte/telemetrie.html (or QR-Code to the right)

Homepage of EVA with EVA-DTS-Standard
https://www.vending-europe.eu/

Introduction

The v-link is a mobile communication solution for vending machines that can be used to read EVA-DTS sales statistics, import configurations and transfer software updates. For this purpose, the v-link supports the IrDA interface and the DDCMP and DEX/UCS protocols commonly used in the vending sector. Further interfaces such as TRS/audio jack plugs or printers can be addressed via cable adapters available separately. v-link is conveniently operated via an Android app, which is provided free of charge.

Read-out statistics can be displayed by the app or sent to a database server via SIM card for further processing.

Installation

The v-link box is not supplied with a fully charged battery, so it must first be inductively charged with a QI charger. Mikrolab recommends using the supplied charger for this purpose. Connect the USB cable of the charger to your PC and place the v-link box in the middle of the device. The box will activate and begin the charging cycle.

The app for controlling the v-link can be obtained free of charge from the Google App Store (search for v-link, or use the QR code to the left) and must be installed on a smartphone or tablet with Android 5.1 to 9.x. A version of the app for iOS does not exist.

Connecting the v-link box to the app for the first time

The *v-link box* must be paired with the smartphone once before it can be used. To do this, perform the following steps:

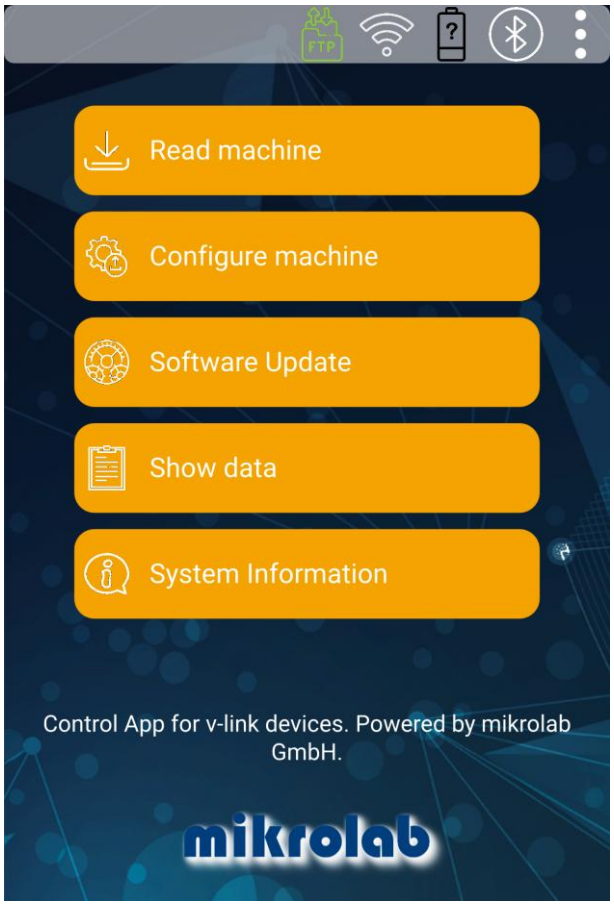
- Start the *v-link box* by pressing the On/Off button.
- Start the app and select the menu item "Search BT device".
- Press "Search". The app will now list all active Bluetooth capable devices nearby.
- Select the device ML_xxxx-yyy (xxxx-yyy corresponds to the serial number on the *v-link box*) and confirm the pop-up message(s). If the *v-link box* does not appear in the list, briefly press its On/Off button and then press "Search" again.
- As soon as the Bluetooth status icon turns green, the app and the box are paired.

These steps are only necessary during the initial start-up; once the App and Box have been successfully paired, they will automatically connect at a later time as soon as they are within range. This can be accelerated by tapping the Bluetooth status icon.

Operating the App

Main menu

The main menu of the v-link app provides access to the most frequently used functions on one page, as well as a status bar at the top of the screen that displays the most important information. Both are discussed in detail in the following sections.



Status bar

The status bar at the top of the screen is visible in every screen of the application and has six icons:

Back Arrow	Description
Weiß	Tap to return to the previous menu page. This icon is not available in the main menu.

Upload icon	Description
Green	Green EVADTS data are transferred to the server (see chapter Transmission of readings to telemetry server)
White	No data present and no connection available.
Blue	Data is ready for upload.

WiFi icon	Description
Green	Data has been transferred to the server
White	No data present and no connection available.
Blue	Blue Data is ready for upload.

The upload and WiFi symbol belong to the telemetry upload functionality, which is described in detail in chapter Transmission of readings to telemetry server.

Battery icon	Description
black and green (much green -> high residual charge)	The symbol indicates the charge level of the connected *v-link box* in 25% steps. If no box is connected or if the charge level cannot be determined, the symbol is displayed with a '?

By tapping on this symbol, the battery level display can be updated.

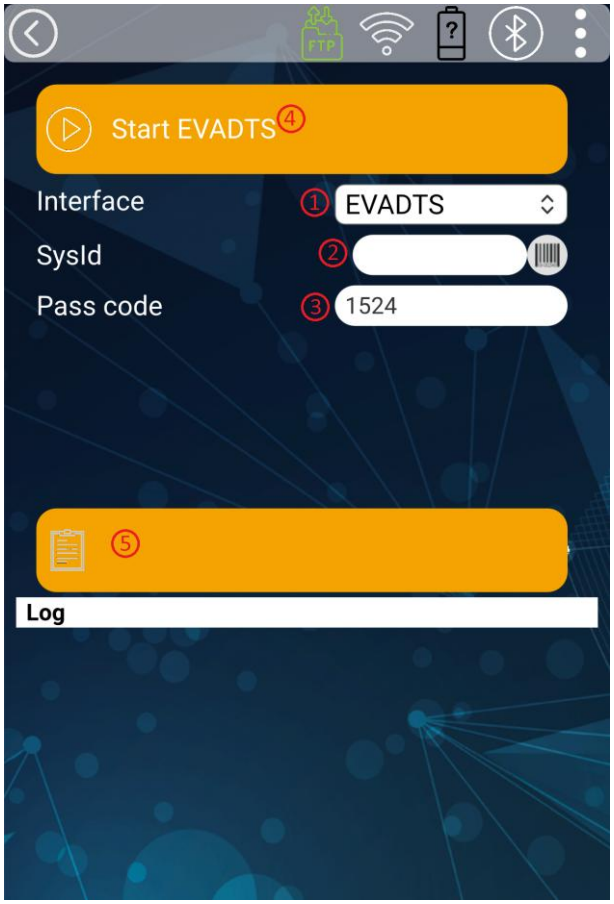
Bluetooth icon	Description
White	The app is not connected to a *v-link box*.
Green	The app is connected to a *v-link box*.
Red	There was an error establishing a connection to the *v-link box*, or an unexpected disconnection.

Tap this icon to establish or terminate the Bluetooth connection to the paired *v-link box*.

Additional settings icon	Action
White	Opens a drop-down menu with further, rarely used menu items when touched (see chapter Additional settings)

Read machine

This menu item can be used to read out vending machines.



For this purpose, under "Interface" you must select which interface and which protocol is to be used to read out the vending machine ❶:

Selection	Interface	Protocol	Notes
EVADTS	IrDA (infrared)	DDCMP	Readout of list 2 with max. 115200 Baud
EVA 30k	IrDA (infrared) with 30kHz modulation	DDCMP	Readout of list 2 with 2400 Baud
DEX/UCS	DEX (audio jack)	DEX-UCS	Readout with 9600 Baud[1]
BT	Bluetooth	proprietary	Direct reading of a v-core
Expert	misc.	misc.	Offers additional configuration options if the parameters of the standard interfaces do not fit the machine (see below)[1]
Printer	Thermal printer protocol	Plain Text	-[1]

[1] A separately available adapter cable is required for a DEX or printer readout.

[2] The file name under which the readout is stored consists of a machine identification as well as the date and time

The parameter SysId ❷ is used to generate the file name for the read data[2]. As an alternative to manual input, the Id can also be read from a barcode via the camera of the smartphone/tablet using the scanner button.

If the machine is secured with a DDCMP security/passport code, this must be entered in the Pass code field in the sequence S2 S1 P2 P1 (see EVA-DTS specifications, chapter 3.6.4.1.1) ❸. This menu item is not displayed for interfaces that do not have passcode functionality.

If the parameters are set correctly, the actual readout can be started. To do this, the *v-link box* must be held in front of the vending machines in such a way that the two IR interfaces are about 30-80 cm away and point towards each other (IrDA readout) or the *v-link box* must be connected to the vending machine via a cable adapter (TRS/audio jack, printer, etc.). The "START xxx" button must then be pressed❹. A progress counter indicates the progress of the readout.

After a successful readout, the readout file is displayed❺[2]. By tapping on the file name, the app switches to the "Show data" page, where the readout can be displayed (see chapter Show data).

If the v-link has successfully read out the machine but is unable to forward the readout to the app, the readout is buffered on the v-link until it is reconnected to the app; the transfer takes place automatically as soon as the two devices are reconnected.

Further processing of the readouts

The read data records are stored on the Device under the public directory "Documents". The *v-link app* creates a directory structure starting with v-linkData for this purpose.

[2] The file name under which the readout is stored consists of a machine identification as well as the date and time of the readout. The SysID is used as identification, or, if it is not set, the first non-empty EVA data field of the following list: ID106 ID101 CA106

Expert configuration

In the expert configuration, further options are available to parameterize the *v-link box* for readout and can be used if the standard readout options are not suitable for the machine type to be readout.

Parameter	Description
SysId	as above
Pass code	as above
Start (Baud)	DDCMP: Baud rate at which the connection to the machine is to be established; anything other than 2400 is almost always wrong here[3]. DEX, Printer: Baud rate at which the machine is to be read out
Max (Baud)	DDCMP: Maximum baud rate at which the actual readout is to take place[Fehler! Textmarke nicht definiert.,4] DEX, Printer: unused
List no.	DDCMP: Number of the list to be read out (see EVA DTS specification, chap. 3.6.1.2 and 3.6.4.1.3) DEX, Printer: unused
Delete	DDCMP: If this option is activated, the v-link sends a "Delete Data" command to the machines after a successful readout (see EVA DTS specification, section 3.6.4.1.5). The "Delete Data" is not sent if the readout fails. DEX, Printer: unused
Protocol	Selection of interface and protocol for the readout; TRS here designates an audio jack. This can be purchased separately as an accessory.

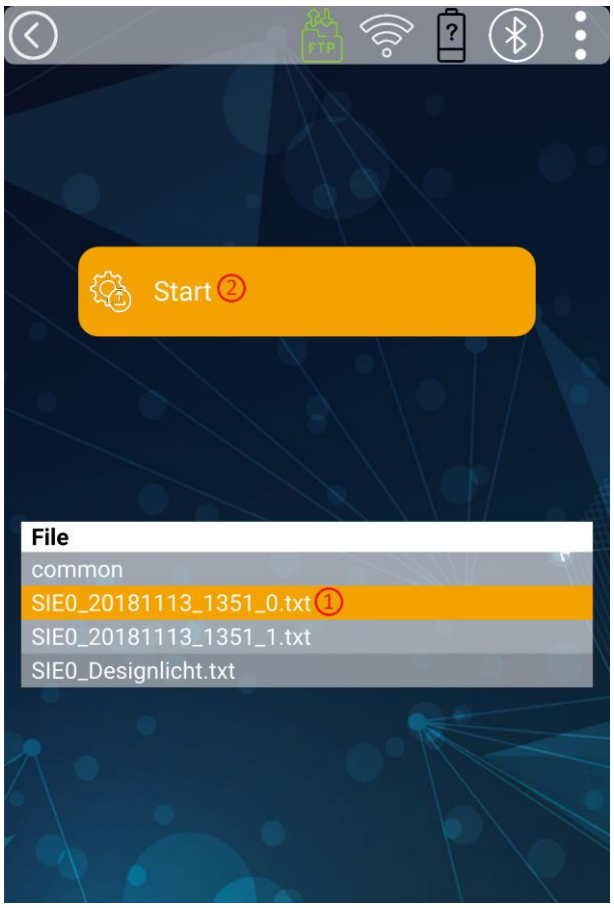
In addition to the expert settings, it is also possible to adjust the communication parameters via a configuration file. This allows settings to be made that go beyond the expert settings, but changing the configuration file also entails risks. Instructions can be found on the mikrolab homepage (see chapter Links).

[3] The "30K" options indicate that a 30kHz modulation should be used at the infrared interface; not supported with DEX and Printer.

[4] The actual transfer rate may be lower if the machine does not support the selected baud rate.

Configure machine

This menu can be used to send EVA-DTS configurations saved as a file to vending machines.



The files must be stored in the file system of the smartphone under *"Your Device"/Documents/v-linkData/Configuration* (see also chapter Directory structure), and then selected in the file browser of the app ❶. The configuration file is then sent by pressing "Start" ❷. To do this, the *v-link box* must be held in front of the vending machines in such a way that the two IR interfaces are about 30-80 cm away and point towards each other (IrDA readout) or the *v-link box* must be connected to the vending machine via a cable adapter (TRS/audio jack, printer, etc.). For interface, baud rate etc. the app uses the same settings that were set during the last readout.

A progress counter shows the progress of the configuration.

Software Update

v-link is able to transfer software updates to a machine via the DDCMP protocol. As with the configurations, the file with the update must be stored in the file system of the smartphone under *"Your Device"/Documents/v-linkData/Software* (see also chapter Directory structure). Select the file in the *v-link* file browser and then press Start to initiate the update. To do this, the *v-link box* must be held in front of the vending machines in such a way that the two IR interfaces are about 30-80 cm away and point towards each other (IrDA readout) or *the v-link box* must be connected to the vending machine via a cable adapter (TRS/audio jack, printer, etc.).

A progress counter shows the progress of the update.

Software update via the v-link button

In the procedure described above, the file is first transferred to the v-link and then sent from the v-link to the machine. If several vending machines are to be updated with the same software, unnecessary waiting times will occur because the software update is already on the v-link box after the first pass. In this case, the update can be significantly accelerated by starting it on the following vending machines using the v-link box button instead of the app (see chapter Operation of the box).[5]

Software updates for the v-link

Mikrolab regularly enhances the v-link software to add new features and eliminate known incompatibilities with vending machines or mobile devices.

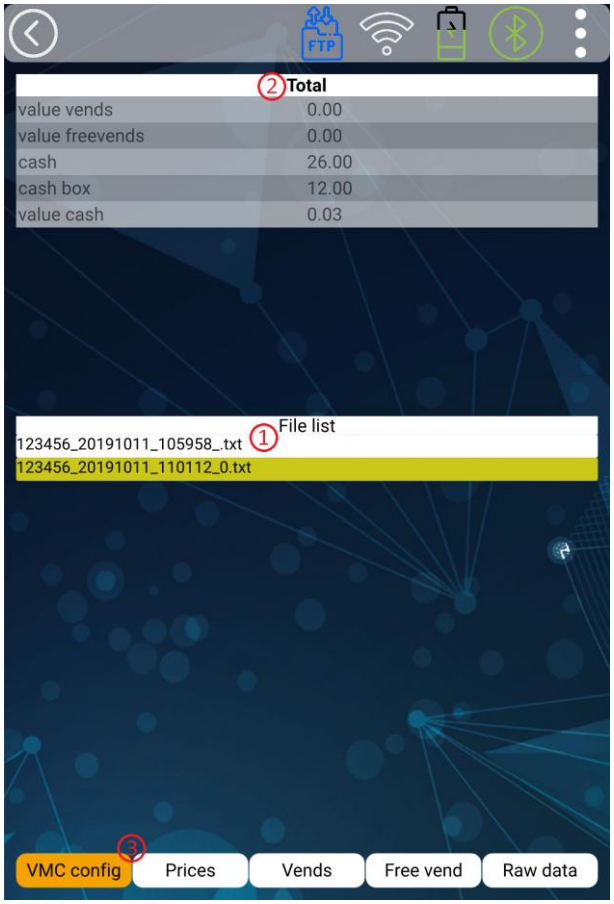
The current version of the *v-link app* is available from the Android App Store. The app automatically checks if a new version is available and updates itself if necessary.

The current firmware for the *v-link box* can be downloaded from the mikrolab homepage. The update must be stored in the subfolder *"Your Device"/Documents/v-linkData/Software/v-link* and is transferred to the box in the same way as a vending machine update; as soon as the box has received it, it restarts and installs the new firmware.

[5] It is important that no other operations (readings or configurations) are carried out between the updates, since the SW update is deleted in this case. The v-link only stores the last SW update.

Show data

Stored and recently read EVA data can be displayed via this menu item..

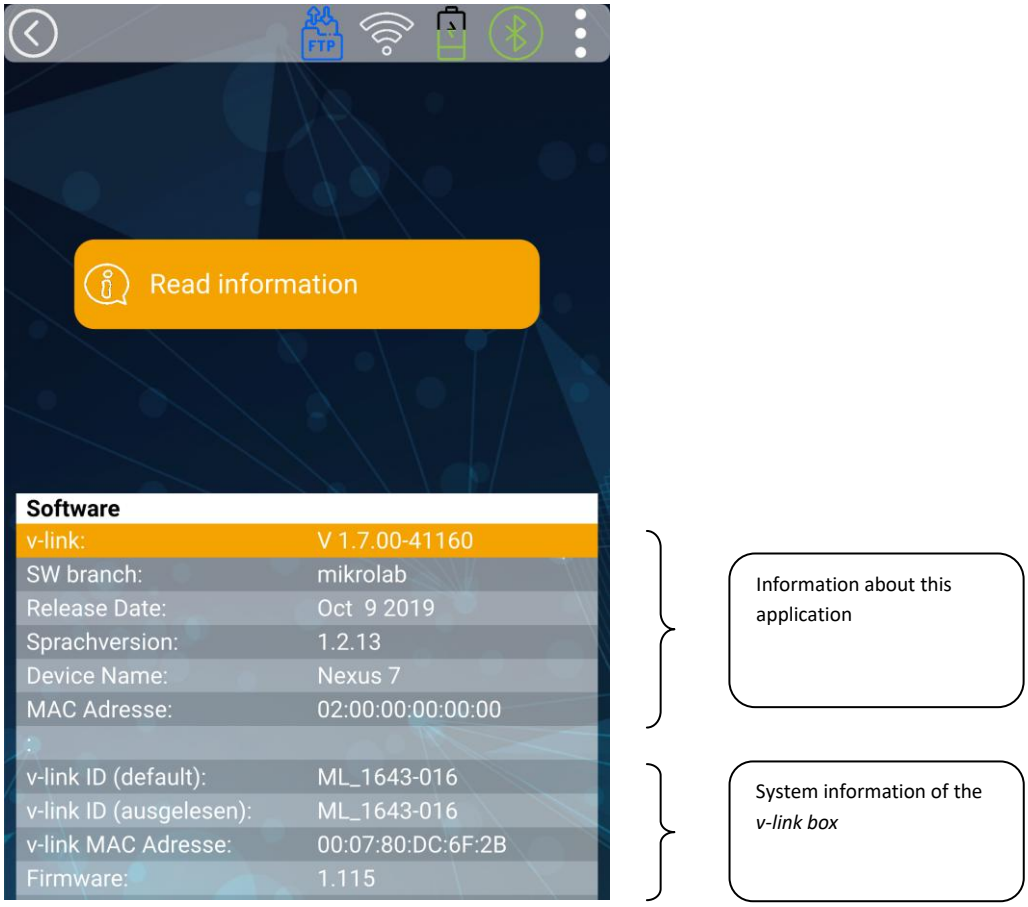


In the file browser the desired file can be selected ❶, in the upper half of the screen the read out data are displayed in tabular form ❷. The details of the readout can be selected at the bottom of the screen ❸:

Name	Description
VMC config	General machine configuration
Prices	Pricing information
Vends	Overview of vends made
Free vend	Overview of the free vends and test vends made
Raw data	Raw data of the readout as received from the machine
Total	Displays the total of products sold and the contents of the cash box.

System Information

This screen displays information about the *v-link app* and the connected *v-link box*.



Additional settings

The additional settings can be opened via the icon in the status bar.

Configuration

Here you can make settings for the *v-link-App*:

Option	Description
System	
Language	User language of the app. Choice of German, English, French and Italian.
Autoconnect	If activated, the app tries to automatically connect to the paired *v-link box* after startup. If not, the connection must be established manually by tapping on the Bluetooth icon in the status bar.
Confirm on exit	If activated, a confirmation dialog is displayed when the connection is terminated.
Machine configuration	
Customer no	Prefixed to the file name during FTP transfer if the flag "Use customer no." is set in the FTP configuration. The customer numbers are managed and assigned by mikrolab and must be set to dotVOS when using the mikrolab telemetry solution.
Pers. no	Is inserted at the 5th position in the file name of the read EVADTS data.

Remote control	
On	It is possible to control the v-link software remotely. This is done via Local TCPIP. With this switch the interface is activated.
Port	Local port via which the remote control communicates.
FTP configuration	
On	Activate FTP transmission of EVADTS data at 1 hour intervals.
Url	The address of the Ftp server (e.g. *ftp:/domain.com/topic* or *ftp:/123.345.456.567/topic*)
Port	The port number of the FTP server.
User	User
Password	Password
Use Customer no.	See Customer No.

Search BT device

This menu item can be used to search for an active *v-link box*, which can then be connected to the app. This usually only has to be done if the app is to be connected to a box for the first time, or if the app is to be connected to another box.

Procedure:

-The v-link must be within Bluetooth range of the tablet/smart phone with the app, and it must not be connected to another device (the LED must not flash blue).

-Turn on the VBox

-Press the "Search" button in the app❶.

If the search was successful, the v-link will appear in the list in the lower half of the screen. All *v-link boxes* have names of the type "MB_xxx", where xxx is an eight-digit serial number. By selecting the entry and confirming the following prompt, the box will be permanently paired with the app, and the app will always attempt to connect to that box.

If the box was not found, the search can be repeated as often as desired. Please note, however, that after 30 seconds the box will enter an energy-saving mode in which its Bluetooth module can no longer be discovered. In this case it would have to be completely deactivated and restarted (press key until the LED lights purple; release, then press key again briefly).

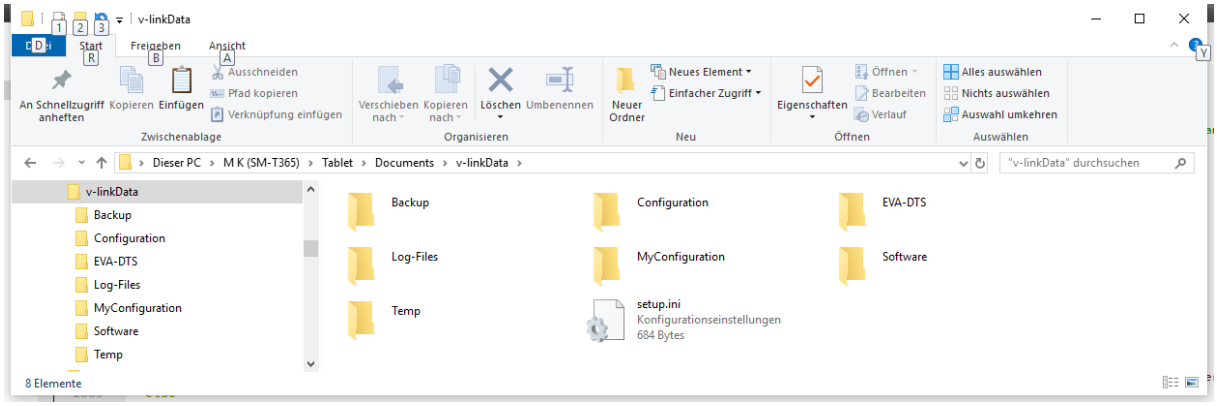
LED Info

An overview of the different LED flash codes of the *v-link-Box*. See also chapter LED codes of the v-Link-Box.

About v-link

Legal information about the *v-link-App*.

Directory structure



Transmission of readings to telemetry server

The read EVADTS data can be transmitted to a telemetry server. The server can be configured and activated in the setup.

See chapter Configuration.

LED codes of the v-Link-Box

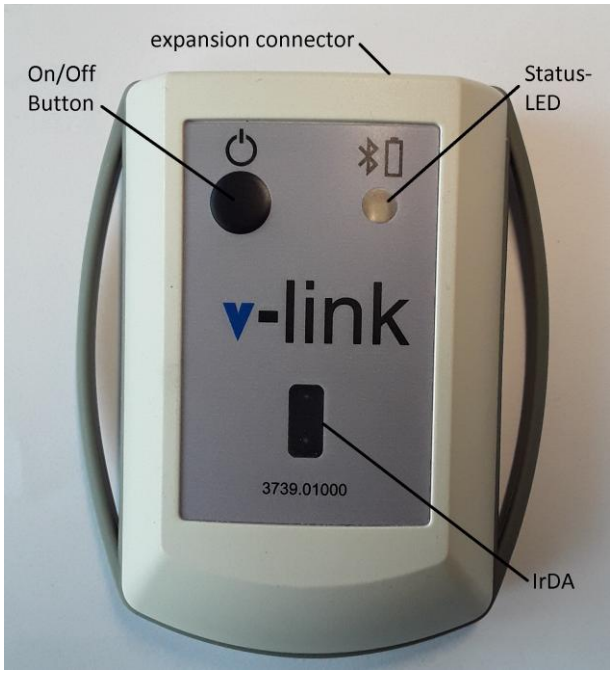
The *v-link box* uses an RGB LED to display status messages:

	Not connected, battery good
	Battery low, please load
	Connected via BT, battery good
	Connected via BT, battery low
	Initialisation or power down after key pressed
	(5x) battery too low, v-link shutting down
	v-link is busy, e.g commencing readout. The LED stays cyan, but is interrupted by th BT-/ battery flashes.
	(2.5sec) Only visible after an operation that was started by a button: The operation was succesful.
	(2.5sec) Only visible after an operation that was started by a button: The operation was not succesful.
	v-link is loading, interrupted by th BT-/battery flashes.
	Continuous
	Slow flashing
	Fast flashing

The slow flashing intervals are about 0.2 / 5.0 s long, the fast ones 0.1s.

If the LED is permanently red after switching on the *v-link box*, the v-link was unable to start its firmware. In this case please contact mikrolab.

Operation of the box



Button

The *v-link box* is equipped with an on/off button with which a readout can be started or the box can be deactivated.

If the v-link is deactivated, it can be switched on by pressing the button.

A short keystroke (< 0.5 s) when the *v-link box* is activated starts communication with a vending machine. The parameters (interface, baud rate, passcode, etc.) used during the last communication (via the *v-link app*) are used for this purpose. This is usually used for readouts, but can also be used to send to several identical machine configurations or software updates.

If the *v-link box* is connected to a v-link app, a readout is transmitted immediately to the app, otherwise it is stored on the v-link and sent to the app at a later time. In this way, up to 48 readouts can be stored.

If the key is pressed for 3 or more seconds on a v-link, the v-link is deactivated after the key is released (see also chapter Charging). The v-link indicates that the three seconds have elapsed by a magenta-coloured glow of the LED.

Operating Modes

The v-link has several operating modes to reduce energy consumption:

Active

This is the state the v-link is in after startup, while it is connected to a v-link app or performing an operation via the key.

Dooze

In this state, the v-link deactivates several systems to save energy. It reacts to keystrokes and a Bluetooth connection from a *v-link app*, but cannot be found by the app via the menu item "Search BT device". The LED continues to function.

Off

The v-link can only be removed from this state by pressing a button or by placing it on a Qi charger.

Charging

The v-link has an inductive charge controller and can be charged on a Qi charger. In the status bar, the v-link app indicates the charge level of a connected v-link. In addition, the v-link signals a low charge level with a red LED flashing. If the v-link is not charged in time, it deactivates itself to prevent deep discharge.

As long as a v-link is on the charging cradle, it cannot be deactivated. This only happens as soon as it is removed from the charging cradle.