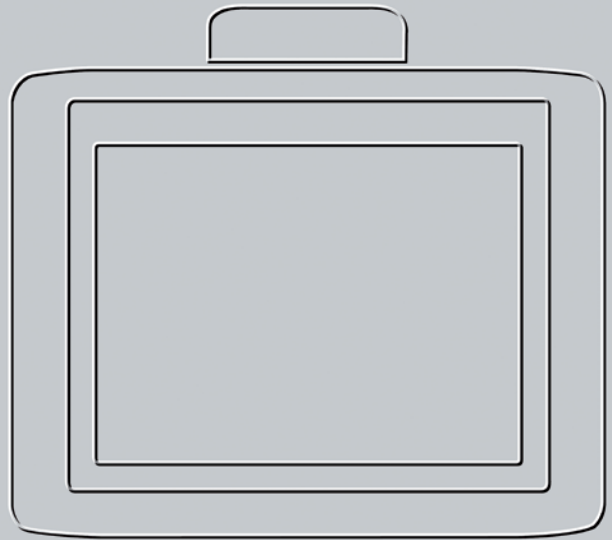


Operating Instructions



DLT-V83 Series Industrial Computer

Operating Instructions V2.00 (EN)

ADVANTECH

Enabling an Intelligent Planet



IMPORTANT:

For safe and proper use, follow these Operating Instructions.

Keep them for future reference.

Operating Instructions completed on March 5, 2019.
Version 2.00

Copyright

This document and the software and hardware included with this product are copyrighted 2019 by Advantech Co., Ltd. All rights are reserved.

This document is intended for reference purposes only. All product specifications are subject to change without notice.

Advantech Co., Ltd. reserves the right to make improvements in this document in the products described in this document at any time without notice.

No part of this document may be reproduced in any form or by any means, electronic, photocopying, recording, translating, transmitting or otherwise, without prior written permission of Advantech Co., Ltd.

Information provided in this document is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

Advantech Co., Ltd. assumes no liability for technical inaccuracies, typographic errors or faults in this documentation. Advantech Co., Ltd. also assumes no liability for damages caused directly or indirectly by the delivery, performance or usage of this material.

Note regarding all links and website content included in this document:

Advantech Co., Ltd. is not responsible for the accessibility of the websites and for the content of external links contained in this document. The content and accessibility of the linked websites are the sole responsibility of their operators.

Acknowledgements

The software and hardware designations as well as the brand names used in this documentation are in most cases also registered trademarks and are subject to the international law (trademark, brand and patent-protection laws). All product names or trademarks are properties of their respective owners.

Windows® is a registered trademark of Microsoft Corporation in the United States (US) and other countries.

Intel® and Pentium® are registered trademarks of Intel Corp.

Bluetooth® is a registered trademark of Bluetooth SIG, Inc. (Special Interest Group).

RAM® and RAM Mount™ are both trademarks of National Products Inc., 1205 S. Orr Street, Seattle, WA 98108.

DLT-V83 Industrial Computers can be delivered with or without preinstalled software. For devices with preinstalled software observe the associated license agreements.

FreeRTOS™ is a registered trademark of Real Time Engineers Ltd (<http://www.freertos.org>).

This product uses FreeRTOS. FreeRTOS is licensed with a modified GNU GPL

<http://www.freertos.org/a00114.html>.

The FreeRTOS source text is available from <http://sourceforge.net/projects/freertos/files/FreeRTOS/V7.4.0/> or from Advantech.

Manufacturer

Advantech Co., Ltd.

No. 1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan, R.O.C.

Table of contents

1. INTRODUCTION	5
1.1. Information about the DLT-V83 manuals	5
1.1.1. Current manual versions	5
1.1.2. Operating instructions for all device models	5
1.1.3. Warnings and notes in the operating instructions	6
2. TECHNICAL CUSTOMER SUPPORT	7
3. FUNCTIONAL DESCRIPTION	8
3.1. Intended use	8
3.2. Mount, operate and service the device correctly	9
3.3. Device identification / name plate	9
4. UNPACKING, TRANSPORTING, STORING DLT-V83	10
4.1. Unpacking	10
4.2. Transporting	10
4.3. Storage	11
5. TECHNICAL DATA OF THE DEVICE	12
5.1. General	12
5.1.1. CPU, chipset, RAM, BIOS	12
5.1.2. Memory	13
5.1.3. Housing, material, weight	13
5.1.4. Display	13
5.1.5. Environmental conditions	14
5.1.6. Resistive touchscreen	15
5.1.7. Projected-capacitive touchscreen (PCT)	16
5.1.8. Device dimensions	17
5.1.9. Internal speaker, sound	20
5.2. Power supply units, power supply	21
5.2.1. Integrated DC power supply unit	21
5.2.2. Integrated AC power supply unit	24
6. TECHNICAL DATA ON RADIO MODULES	27
6.1. Identification of the equipment variants	27
6.2. Radio cards	27
6.2.1. Available radio cards for WLAN	27
6.2.2. Available Radio cards for WWAN	29
6.3. Antennas	30
6.3.1. WLAN antenna diversity, low profile IEEE 802.11 a/b/g/n	30
6.3.2. WLAN antenna IEEE 802.11 a/b/g/n/ac	31
6.3.3. WLAN, WWAN 3G	32
6.3.4. WLAN, WWAN, LTE 4G antenna (Multiband)	33
6.3.5. External WLAN antenna IEEE 802.11 a/b/g/n	34
6.3.6. External WWAN antenna 3G	35
6.3.7. External WWAN antenna 2G, 3G, 4G	36
6.4. Bluetooth (optional)	37
6.4.1. Bluetooth integrated: WLAN card SPARKLAN WPEQ-261ACN (BT) 37	37
6.4.2. Micro Bluetooth adapter (USB stick)	37
6.5. GPS receiver external (optional)	38
7. INTERFACES, CONNECTORS	39
7.1. Integrated	39
7.1.1. LCD interface	39
7.1.2. Touch interface	39
7.2. External	40
7.2.1. Serial interfaces	40
7.2.2. USB, Service-USB	40
7.2.3. Audio interface for handset	40
7.2.4. Network interface	40
7.3. Serial interfaces - Functions	41
7.3.1. COM1 as a voltage source (optional)	41
7.3.2. COM2 as EIA-422/485 (optional)	41
7.3.3. Network adapter (10/100/1000)	41
7.3.4. CAN, digital I/O and second Ethernet interface (optional)	42
7.3.5. Serial interface barcode scanners	44
7.3.6. Tips & tricks	44
7.4. Connections under the cable cover	45
7.4.1. DC devices: connections, expansion interfaces	45
7.4.2. AC devices (DLT-V8315 only): connections, expansion interfaces	46
7.5. Connections underneath the antenna/protective cap	47
7.5.1. Information on service USB, CFast and Mini SIM card slot	47
8. OPEN/CLOSE ANTENNA (OR PROTECTIVE CAP)	48
8.1. Avoid Property damage	48
8.1.1. Disconnecting from the electric power source	48
8.1.2. Tools required	48
8.2. Open/close protective cap	49
8.3. Open/close antenna	49
8.3.1. WLAN antenna IEEE 802.11 a/b/g/n	49
8.3.2. WLAN antenna IEEE 802.11 a/b/g/n/ac	50
8.3.3. WLAN, WWAN 3G antenna	51
8.3.4. WLAN, WWAN antenna (multi-band) LTE 4G	52
9. OPERATING THE DEVICE	54
9.1. Safety notes for normal operation, control	54
9.2. Switching the DLT-V83 on/off	56
9.3. Operating the touchscreen	56
9.3.1. Prevent damage to the touchscreen	57
9.3.2. Operating the resistive touchscreen	57
9.3.3. Operating the PCT touchscreen	57
9.4. DLT-V83 front keys with resistive touchscreen	58
9.4.1. Overview of the operating elements on the device front	58
9.4.2. Device with 26 front keys	59
9.4.3. Device with 5 front keys	61
9.4.4. Operating states	62
9.5. DLT-V83 front keys with PCT touchscreen	63
9.5.1. Overview of the operating elements on the front side	63
9.5.2. Function of the front keys	63
9.5.3. Operating states	64
9.6. Software keyboard (optional)	65
10. GENERAL DEVICE CONFIGURATION	66
10.1. Operating systems (optional)	66
10.2. Image compatibility of varying CPUs	66
10.3. Linux OS (optional)	66
10.4. MS-Windows OS (optional)	67
10.4.1. Setting up MS-Windows	67
10.4.2. USB recovery stick	67
10.4.3. WES 7 and Win 7 Prof.: USB icon in the taskbar	67
10.5. Configuring the front keys, automatic shutdown, etc.	68
10.6. Automatic shutdown	69
10.6.1. Functional description	69
10.6.2. Sequence	69
10.7. CAN and digital I/O settings (optional)	70
10.7.1. iManager	71
10.8. Protecting the display from the memory effect	72
10.9. (Re)calibrating the touchscreen	72
10.10. ErP settings for AC devices	73
10.10.1. BIOS settings in order to deactivate WakeOnLAN	73
10.10.2. MS-Windows settings for deactivating WakeOnLAN	73
10.10.3. Power options	74

11. WLAN CONFIGURATION	75	16. OPTIONAL EQUIPMENT/ACCESSORIES	136
11.1. Safety notice	75	16.1. Integrated UPS (optional)	136
11.2. Differences between MS Windows and Linux	76	16.1.1. UPS Battery pack specification.....	137
11.3. Preparation work at the factory.....	76	16.1.2. Charging the integrated UPS correctly	138
11.4. Customer-specific settings	77	16.1.3. No repair/replacement of the battery packs.....	138
11.5. Windows Zero Configuration (WZC).....	77	16.2. Screen-Defroster (optional)	138
11.6. Advantech WLAN Client Manager (IGX Tool)	78	16.3. Pre-converter and power cables (optional).....	139
11.6.1. Area of application	78	16.4. Voice Kit (optional).....	139
11.6.2. After image reinstallation: Driver installation	78	16.5. Terminal mountings (optional)	140
11.6.3. Requirements.....	78	16.6. Keyboards and keyboard holders (optional).....	140
11.6.4. Driver installation WinEmbStd7	79	16.7. Stylus for touchscreens (optional)	141
11.6.5. Driver installation Win7Pro / Win 8.1 IndPro / Win 10 IoT.....	81	16.8. External CD/DVD-ROM drive (optional)	141
11.6.6. Start WLAN Client Manager, Login	86	16.9. USB recovery stick (optional)	142
11.6.7. WLAN Client Manager functions	88	16.10. Scanner and scanner bracket (optional).....	142
11.6.8. License.....	88	16.11. Sun visor (optional).....	142
11.6.9. Browse nearby wireless networks	89	16.12. Protective film for touchscreen (optional)	142
11.6.10. Roam Management	96		
11.6.11. Laird Connection Manager (LCM)	101		
12. WWAN CONFIGURATION	103	17. MAINTENANCE, CLEANING	143
12.1. Safety notice	103	17.1. Manufacturer, authorized service centers	143
12.2. Differences between MS Windows and Linux	104	17.2. No repair/replacement of the battery packs.....	143
12.3. Preparation work at the factory (DLT-V83 delivery status).....	104	17.3. Regular checks and maintenance of the complete system	143
12.4. SIM card for WWAN (customer-specific).....	105	17.4. Cleaning the device	144
12.5. Configuration of radio card SIERRA WIRELESS MC80	105	17.4.1. Cleaning the housing	144
12.5.1. Open device manager	106	17.4.2. Cleaning the touchscreen	144
12.5.2. Establish Internet connection.....	106	17.5. Touchscreen protective film (optional).....	145
12.5.3. SIERRA WIRELESS MC80 Trouble Shooting	109		
12.6. Configuration of Radio card QUECTEL EC25	112	18. MALFUNCTIONS	146
12.6.1. Establish Internet connection.....	112		
12.6.2. QUECTEL EC25 Trouble Shooting	115	19. REASONABLY FORESEEABLE MISUSE	148
13. MECHANICAL MOUNTING	118	19.1. General	148
13.1. Warning about injuries and Property damage	118	19.2. Mobile application on vehicles	148
13.1.1. Important: Installation of the DLT-V83 on vehicles	119	19.3. Stationary use with AC power supply unit	148
13.2. Overview of mounting steps	120	20. GUIDELINES AND CERTIFICATES	149
13.3. Connecting external accessories to the DLT-V83	120	20.1. Simplified EU declaration of conformity	149
13.4. Attaching device mounting and accessory mounting (optional).....	121	20.2. Low-voltage guidelines	149
13.4.1. VESA drill holes	121	20.3. EMC guidelines.....	149
14. ELECTRICAL CONNECTION	124	20.3.1. Shielded components	149
14.1. Connection to the power supply	124	20.3.2. EMC EU	149
14.2. Connecting DC devices to the power supply.....	125	20.3.3. FCC USA	149
14.2.1. Important: Electrical connection of the DLT-V83 to vehicles.....	126	20.3.4. ICES Canada	150
14.2.2. Electrical installation of DC devices.....	126	20.4. RoHS Directive EU	150
14.2.3. Electrically isolated installation of DC devices	127	20.5. RED (Radio Equipment Directive) 2014/53/EU	151
14.3. Connecting AC devices to the power supply	128	20.6. Eco-design directive (2009/125/EC)	152
14.3.1. Electrical installation of AC devices.....	128	20.7. CE marking	152
15. ATTACHING THE CABLE COVER	129	20.8. CCC, SRRC China	152
15.1. Overview of mounting steps	129	20.9. CNROHS	153
15.2. Required components	130	20.10. MIC Japan (previously TELEC)	153
15.3. Attaching cable grommets and fixing strain relief in place	131	21. RECYCLING INFORMATION	154
15.3.1. Attaching the cable cover (without integrated UPS).....	134		
15.3.2. Attaching the cable cover (with integrated UPS).....	134	22. LIST OF FIGURES	155
15.4. Pressure compensation element	135		

1. Introduction

1.1. Information about the DLT-V83 manuals

Available manuals (in printed form or on the Internet, download areas):

	Contents	For target group	Availability
Safety instructions	Important information about protecting personnel and property	Skilled personnel	Printed, enclosed with the device
Quick Start and Installation Guide	First steps in commissioning, mechanical and electrical installation and mounting	Skilled personnel	Printed, included with the device
Operating instructions	Complete operating instructions	Skilled personnel	PDF file at our websites
DLoG Config, Software Keyboard,	Description of software tools for the DLT-V83 series	Skilled personnel	PDF file at our websites
Mounting instructions for optional accessories	Information about mounting	Skilled personnel	Printed, enclosed with the respective accessories

- ⇒ Pay attention to these instructions because they help avoid hazards, reduce repair costs and downtimes, and increase the reliability and service life of the DLT-V83.
- ⇒ Keep the instructions for future use.
- ⇒ Please contact Advantech if you require additional information or clarification. You can find the contact address in section *Technical customer support*.

1.1.1. Current manual versions



The latest versions of our manuals are available at our websites:

www.advantech.com

www.advantech-service-iot.eu

1.1.2. Operating instructions for all device models

These operating instructions apply to all models of the DLT-V83 series. Differences with regard to operation, functionality, etc. are clearly indicated.

1.1.3. Warnings and notes in the operating instructions

Personal injury

Information with regard to personal injury is shown as follows (signal words for indicating risk level):



DANGER / WARNING / CAUTION

DANGER means that death or severe bodily injury will occur if this information is not observed.

WARNING means that death or severe bodily injury can occur if this information is not observed.

CAUTION means that slight bodily injury can occur if this information is not observed.

Property damage

Information about Property damage is shown as follows:

NOTICE: Property damage

Information about possible Property damage.

Tips for handling product and operating instructions

Tips for handling product and operating instructions are shown as follows:

TIP

Tips for using the product.



Note about additional information in operating instructions.

2. Technical customer support

Contact your distributor, sales representative, or an Advantech Service Center for technical support.

Please have the following information ready:

- Product name
- Serial number
- Description of your peripheral attachments
- Description of your software (operating system, application software, etc.)
- The exact wording of any error messages
- A complete description of the problem

Find the contact data of our Global Advantech Service Centers on website:

<http://erma.advantech.com>

3. Functional description

3.1. Intended use

DLT-V83 Industrial Computers are data communication terminals for use in commercial environments (e.g. logistics, warehousing, manufacturing). Any other or additional use beyond this shall be deemed an improper use. The user/operator of the DLT-V83 is solely responsible for any resulting damage. This also applies to any unauthorized modifications made to the device. Indented use includes the compliance with all safety instructions and the compliance with the approved environmental conditions and specifications for the device.



The DLT-V83 Industrial Computers:

- are not approved for use in EX zones (potential explosion hazard).
- are not approved for use on ships.
- are not approved for use on railed vehicles.
- are not approved for use in life-support systems or critical safety systems where system malfunction can lead to the direct or indirect endangerment of human life.

Accessories

Only use accessories that have been tested and approved for the respective DLT-V83. Otherwise, any warranty for this device will be void.

Requirements for safe operation

The requirements are:

- Proper transport and storage.
- Proper setup and use.
- Proper maintenance and service.
- Operation by trained personnel.

3.2. Mount, operate and service the device correctly

DLT-V83 Industrial Computers were designed and built according to modern technology and accepted safety regulations.

However, the operation of the DLT-V83 can endanger personnel or third parties and cause damage to the device and other material assets when, for example, the device is:

- installed incorrectly or configured improperly.
- operated by untrained or uninstructed personnel.
- improperly operated and maintained.
- not used as intended.

The owner/operator commitments with regards to safety (accident prevention regulations, occupational safety) are to be followed.

3.3. Device identification / name plate

The name plate on the rear side of the DLT-V83 must be legible at all times.

⇒ Do not damage the name plate or remove it from the device.

Information on the labels on the device (examples):

- Model name, e.g. DLT-V8310, DLT-V8312, DLT-V8315
- Serial number
- FCC ID (Radio)
- Barcode for internal use only

4. Unpacking, transporting, storing DLT-V83

4.1. Unpacking

- ⇒ Open the packaging carefully.
- ⇒ Save the packaging material (for possible forwarding transports or returns of the DLT-V83).
- ⇒ Check the shipment for completeness and any possible damage.
- ⇒ Always keep the supplied operating instructions and documents.

4.2. Transporting



WARNING

Personal injury from battery packs: Short-circuit, fire, chemical burns, toxic substances.

Devices with integrated UPS (optional) contain lithium-ion battery packs (hereinafter referred to as: battery packs). These can ignite if handled improperly (risk of fire), cause chemical burns or release toxic substances.

- ⇒ Be careful when handling battery packs.
- ⇒ Do not drop or damage battery packs.
- ⇒ Do not allow water or other liquids to come into contact with the device (exercise particular caution with corrosive liquids).

Risk of injury due to the weight of the device.

The DLT-V83 can fall down and cause injuries due to its weight.

- ⇒ Always hold the DLT-V83 by the housing with both hands.
- ⇒ Never use the antenna cap as a handle. It can break due to the weight involved.
- ⇒ Use the assistance of a second person for installation work.

Risk of injury due to sharp-edged parts on the device.

The strain relief rail of the DLT-V83 can have sharp edges and cause cutting injuries.

- ⇒ Do not hold the DLT-V83 by the strain relief rail.

If a return/repacking is necessary

If the DLT-V83 is being returned to the manufacturer, a completely filled-out return shipment form must be enclosed with every DLT-V83.

You can find the return shipment form at the end of this operating instructions and on our websites.

- ⇒ Repackage the device using suitable packaging material to ensure that the device is not damaged during transport.
- ⇒ For devices with integrated UPS/battery packs, comply with the transport conditions for battery packs.
- ⇒ Use the required package labels and accompanying documents.

4.3. Storage



WARNING

Personal injury from battery packs: Short-circuit, fire, chemical burns, toxic substances.

Devices with integrated UPS/battery packs can ignite if stored improperly (risk of fire), cause chemical burns or release toxic substances.

- ⇒ Store the cable cover with battery packs separately from the DLT-V83 device.
- ⇒ Handle the cable cover with battery packs carefully; do not damage; do not drill through and do not crush or drop.
- ⇒ Store segregated, separate from acids and other materials.
- ⇒ Store in a cool, dry place.
- ⇒ Comply with the specified environmental conditions for storage.
- ⇒ Provide for sufficient ventilation of the storage location.
- ⇒ Do not allow water or other liquids to come into contact with the device (exercise particular caution with corrosive liquids).
- ⇒ Do not store the device near sources of heat or fire, open flames or heaters.
- ⇒ Do not allow it to come into contact with fire.
- ⇒ Have suitable fire extinguishers ready (foam or powder) in accordance with safety regulations.

Prevent Property damage due to deep discharge

Storing the battery packs incorrectly will cause them to discharge completely (deep discharge) and thus damage them irreparably.

- ⇒ Place the DLT-V83 into operation within 3 (three) months after receiving it.
- ⇒ Charge the integrated battery packs by connecting the DLT-V83 to the power supply.
- ⇒ If you are not placing the DLT-V83 into operation within 6 (six) months, make sure you charge it intermediately.

Protecting touchscreens from damage

- ⇒ Protect touchscreens from sharp edges, impacts, and heavy objects.
- ⇒ If stacking, do not stack higher than four devices.
- ⇒ Place devices front-to-front in this case. The VESA mounting point on the rear side of the device can damage the touchscreen of another device.
- ⇒ Use protective material (non-flammable!) between the devices as a precaution.

5. Technical data of the device

5.1. General

5.1.1. CPU, chipset, RAM, BIOS

Intel® Atom™ D525 processor 1.80 GHz (dual core)	
CPU Chipset Cache	Intel® Atom™ D525 processor 1.80 GHz (dual core) 800 MHz Front Side Bus (FSB) and 800 MHz memory bus speed, 1 MB L2 cache, 45 nm System chipset Intel® ICH8M
RAM	Up to 4 GB DDR3 technology
BIOS	AMIBIOS® - Flash BIOS with ACPI, PnP Programmable in the system, BIOS POST self-test
Real-time clock	Real-time clock with a power reserve of up to 5 years

Intel® Core™ i5-4300U processor (4th Generation Intel® Core™ i5)	
CPU Chipset Cache	Intel® Core™ i5-4300U (4th Generation Intel® Core™ i5) 1.90 GHz (dual core) Max. 2.9 GHz turbo clock rate DDR3L 1600 Intel® Smart Cache 3 MB, 22 nm
RAM	Up to 16 GB DDR3L technology
BIOS	AMI UEFI BIOS @ 128 Mb Programmable in the system, BIOS POST self-test
Real-time clock	Real-time clock with a power reserve of up to 5 years

Intel® Celeron® 2980U processor	
CPU Chipset Cache	Intel® Celeron® 2980U 1.60 GHz (dual core) DDR3L 1600 Intel® Smart Cache 2 MB, 22 nm
RAM	Up to 8 GB DDR3L technology
BIOS	AMI UEFI BIOS @ 128 Mb Programmable in the system, BIOS POST self-test
Real-time clock	Real-time clock with a power reserve of up to 5 years

5.1.2. Memory

CFast SLC technology	Optional, based on SLC technology (single level cell)
CFast MLC technology	Optional, based on MLC technology (multi-level cell)
SSD 2,5"	Optional, based on MLC technology (multi-level cell)

5.1.3. Housing, material, weight

Material	Rugged aluminum-cast housing ESD safe
Weight	DLT-V8310: 4 kg DLT-V8312: 5.5 kg DLT-V8315: 6.4 kg
Dimensions	See <i>Chapter 5.1.8 Device dimension</i>

5.1.4. Display

DLT-V8310	10.4" SVGA 800 x 600, 400 cd/m ² Brightness control
	<u>Or:</u> 10,4" XGA 1024 x 768, 400 cd/m ² Brightness control
DLT-V8312	12.1" XGA 1024 x 768, 500 cd/m ² Brightness control
DLT-V8315	15" XGA 1024 x 768, 400 cd/m ² Brightness control

The LCD display of the DLT-V83 series fulfills the highest quality standards and was inspected for pixel defects. However, due to technological reasons pixel defects can occur.

This is not a malfunction; it is a part of the technical specifications.

5.1.5. Environmental conditions

DLT-V83 without integrated UPS	
Operating temperature	-30 to +50 °C Specification according to EN 60068-2-1/2
Storage temperature	-30 to +65 °C Specification according to EN 60068-2-1/2
Relative humidity	10% to 90% at 40 °C relative humidity, noncondensing Specification according to EN 60068-2-3
Mechanical vibration and shock resistance	<p>DLT-V8310 and DLT-V8312:</p> <ul style="list-style-type: none"> - Class 5M3 according to EN 60721-3-5 - US Highway Truck according to MIL-STD 810F <p>DLT-V8315:</p> <ul style="list-style-type: none"> - Class 5M2 according to EN 60721-3-5 - US Highway Truck according to MIL-STD 810F

DLT-V83 with integrated UPS (optional)	
Operating temperature	-10 to +50 °C
Charging temperature	0 to +45 °C (internal device temperature)
Storage temperature	-20 to +60 °C; specification according to EN 60068-2-1/2
Relative humidity	10% to 90% at 40 °C relative humidity, noncondensing; specification according to EN 60068-2-3
Mechanical vibration and shock resistance	<p>DLT-V8310 and DLT-V8312:</p> <ul style="list-style-type: none"> - Class 5M3 according to EN 60721-3-5 - US Highway Truck according to MIL-STD 810F <p>DLT-V8315:</p> <ul style="list-style-type: none"> - Class 5M2 according to EN 60721-3-5, - US Highway Truck according to MIL-STD 810F

5.1.6. Resistive touchscreen

Standard version

DLT-V8310	
Type	4-wire analog resistive touchscreen
Construction	Device without Screen-Defroster: Film-Film-Glass (FFG), fully laminated front. Device with Screen-Defroster: Buffer-film-film-glass heater
Resistance	Chemically hardened glass
Hardness of surface	JIS-K-5400: 3 H at 750 g Shock resistance IK08 according to IEC 62262
Mechanical resistance	Tapping: > 1 million times with rubber test pen Swiping: > 100,000 times with polydactyl pen
Resistance to industrial chemicals	Alcohols, dilute acids, dilute alkalis, esters, hydrocarbons, ketones, household cleaning agents (according to DIN 42 115)

DLT-V8312 and DLT-V8315	
Type	8-wire analog resistive touchscreen
Construction	Device without Screen-Defroster: Film-Film-Glass (FFG), fully laminated front. Device with Screen-Defroster: Buffer-film-film-glass heater
Resistance	Chemically hardened glass
Hardness of surface	JIS-K-5400: 3 H at 750 g Shock resistance IK08 according to IEC 62262
Mechanical resistance	Tapping: > 5 million times with rubber test pen Swiping: > 100,000 times with polydactyl pen
Resistance to industrial chemicals	Alcohols, dilute acids, dilute alkalis, esters, hydrocarbons, ketones, household cleaning agents (according to DIN 42 115)

Sunlight readable touchscreen version (optional)

Sunlight readable touchscreen	
Type	5-wire analog resistive touchscreen
Construction	Film-Glass (FG), chemically toughened glass
Hardness of surface	JIS-K-5400: 1 H at 750 g Shock resistance IK08 according to IEC 62262
Mechanical resistance	Tapping: > 10 million times with rubber test pen Swiping: > 100,000 times with polydactyl pen
Chemical resistance to industrial chemicals	Hydrogen peroxide, iso alcohol 50 5, iso alcohol 70%, mineral spirits, gasoline, motor oil, diesel fuel, transmission fluid, brake fluid, antifreeze, hydraulic oil, bleach, ethanol, turpentine, acetone, "diethylene glycol monoethyl ether acetate", toluene, petroleum ether, hydrochloric acid, glycol ether acetate, MEK, heptane, sodium hydroxide

5.1.7. Projected-capacitive touchscreen (PCT)

Some DLT-V83 device models are available optionally with a PCT, for example:

- DLT-V8310 XGA with 9 front keys
- DLT-V8310 SVGA with 9 front keys
- DLT-V8312 with 9 front keys
- DLT-V8315 with 9 front keys

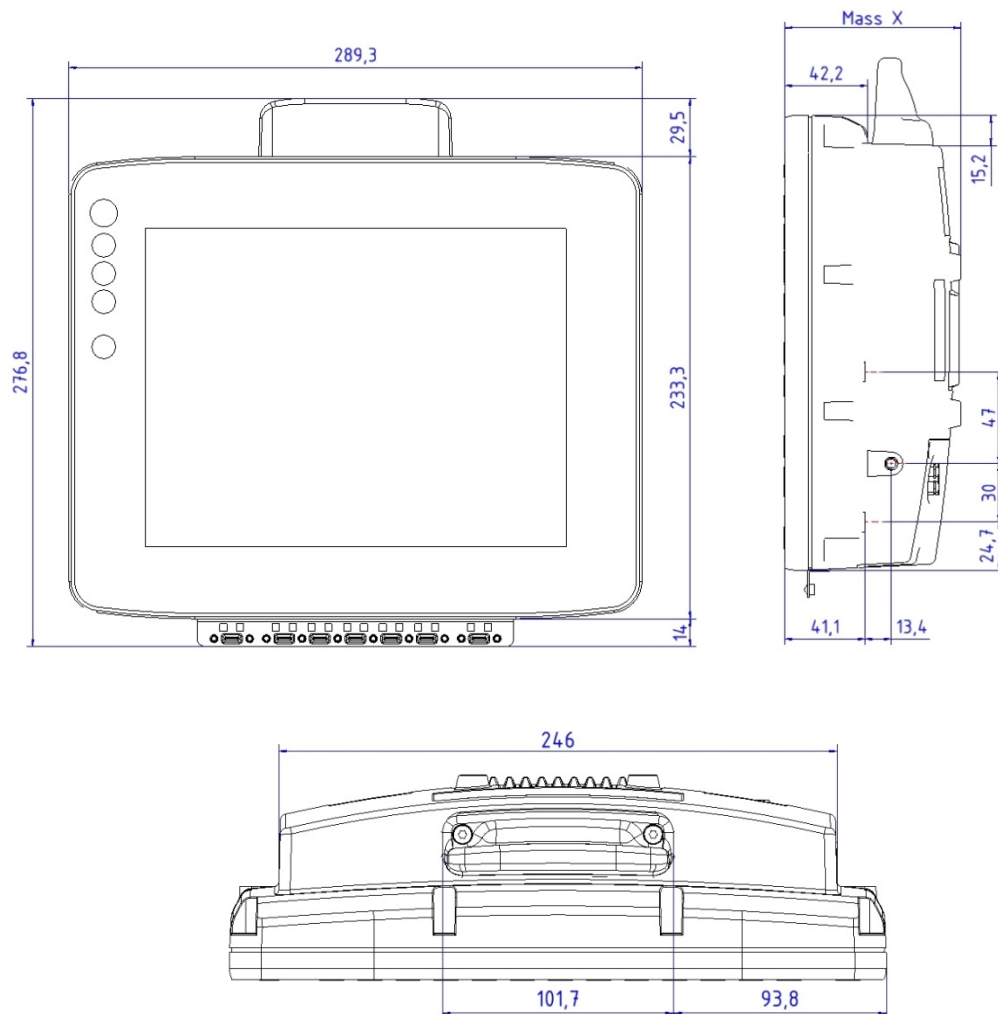
PCT touchscreen	
Type	Projected-capacitive touchscreen
Construction	Glass film
Hardness of surface	Hardness JIS-K-5400: > 10 H at 750 g Shock resistance IK08 according to IEC 62262 Chemical AR coated glass with gloss value 60 according to ISO 2813, 7668; ASTM D 523, D 2457; DIN 67539
Mechanical properties	Thermally pre-stressed, acid-etched planibel float glass
Chemical resistance	Resistant to chemicals. Not resistant to strong acids, gasoline and diesel.

5.1.8. Device dimensions

DLT-V8310

Dimensions without add-ons (in mm)

Fig. 5.1: Dimensions DLT-V8310



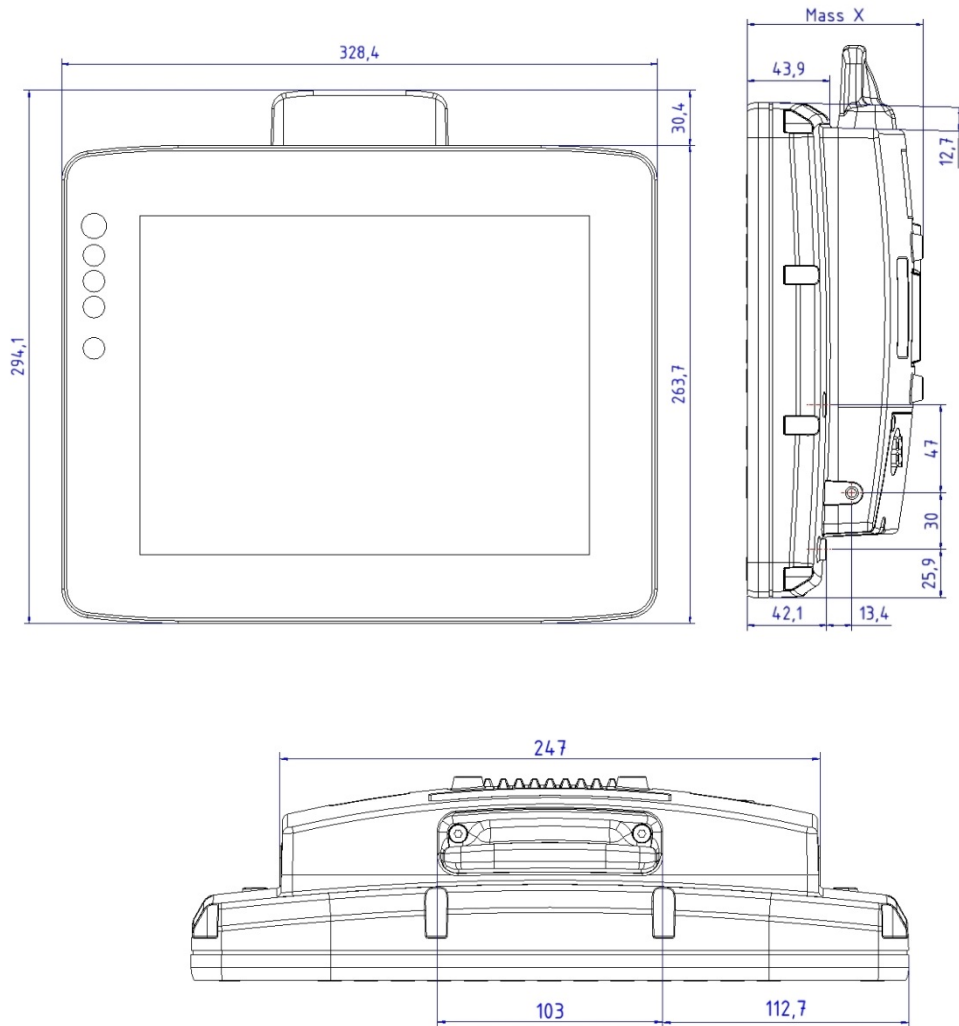
The building depth of the DLT-V8310 varies depending on the type of touchscreen:

Device type	Building depth (Mass X, see figure)
DLT-V8310 standard resistive touchscreen	90,0 mm
DLT-V8310 sunlight readable resistive touchscreen	90,0 mm
DLT-V8310 PCT touchscreen	91,5 mm
DLT-V8310 with screen-defroster front	90,7 mm

DLT-V8312

Dimensions without add-ons (in mm)

Fig. 5.2: Dimensions DLT-V8312



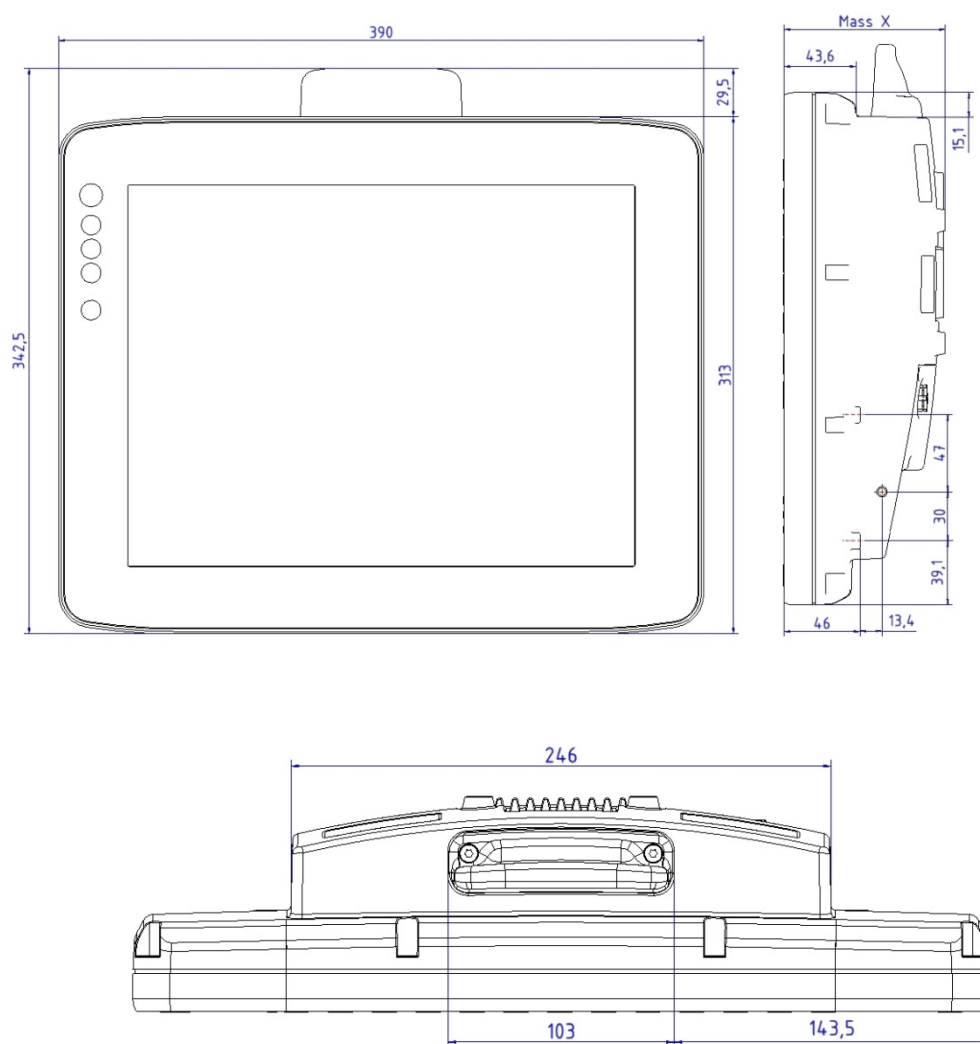
The building depth of the DLT-V8312 varies depending on the type of touchscreen:

Device type	Building depth (Mass X, see figure)
DLT-V8312 standard resistive touchscreen	93,0 mm
DLT-V8312 sunlight readable resistive touchscreen	94,7 mm
DLT-V8312 PCT touchscreen	96,0 mm
DLT-V8312 with screen-defroster front	94,2 mm

DLT-V8315

Dimensions without add-ons (in mm)

Fig. 5.3: Dimensions DLT-V8315



The building depth of the DLT-V8315 varies depending on the type of touchscreen:

Device type	Building depth (Mass X, see figure)
DLT-V8315 standard resistive touchscreen	98 mm
DLT-V8315 PCT touchscreen	97 mm

5.1.9. Internal speaker, sound

The DLT-V83 is equipped with an internal speaker as standard (2 W).

The system messages from the Industrial Computer are output via this speaker.

The internal speaker is configured in the audio settings for the operating system in question.



Fig. 5.4: Internal speaker position

5.2. Power supply units, power supply

5.2.1. Integrated DC power supply unit

DC voltage supply connection

Version: Phoenix Combicon, 3-pin.

External view:

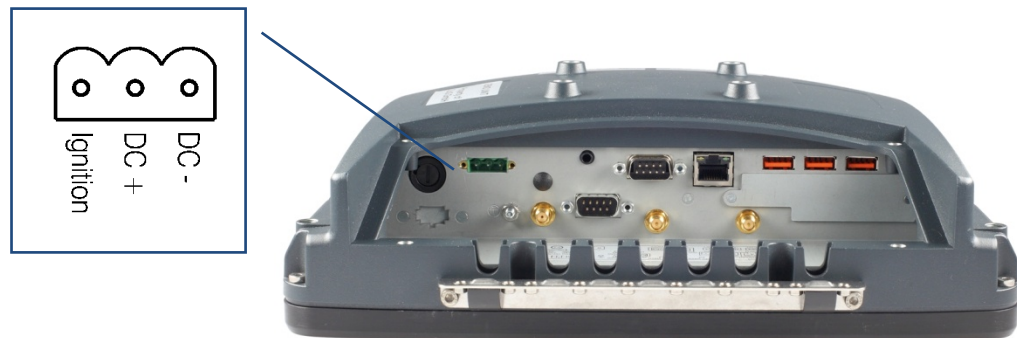


Fig. 5.5: DC power supply connector with connector detail view

Explanation:

“Ignition on” means that a control signal can be routed to this connection (e.g., ignition of a vehicle), that matches the supply voltage level and is able to supply at least 1 W to the DLT-V83.

The signal reference is DC-.

Power supply, power consumption, power supply unit fuses

Power supply	
DC power pack 12/24/48 VDC (wide-range power supply unit) 60 W / 80 W internal Type DC-16	12/24/48 VDC nominal Galvanically isolated Withstands bursts up to 2 kV Full output power of the 12/24/48 VDC power supply unit for 20 seconds each: For 6 V: 40 W For 9 V: 60 W Rising in linear fashion between the above
Voltage range	9 to 60 VDC
Bridged power failures	Typically 2 ms at 12 V Typically 10 ms at 24 V Typically 40 ms at 48 V
Maximum output power	60 W (+10 to +70 °C internal device temperature); or 80 W (-30 to +10 °C internal device temperature)
Nominal current	8.4 A
Connection to SELV circuit only	The SELV circuit is a secondary circuit that is designed and protected so that its voltages will not exceed a safe value both when operating correctly or if a single error occurs.

Power consumption DLT-V83 Intel® Atom™ D525	
DLT-V8310	Typically 25 W, Standby typically 1 W
DLT-V8312	Typically 30 W, Standby typically 1 W
DLT-V8315	Typically 30 W, Standby typically 1 W

Power consumption DLT-V83 Intel® Core™ i5-4300U and Intel® Celeron® 2980U	
DLT-V8310	Typically 35 W, Standby typically 1 W
DLT-V8312	Typically 40 W, Standby typically 1 W
DLT-V8315	Typically 40 W, Standby typically 1 W

Power supply unit fuses		
Power supply unit	Fuse type	Example
DC-16	5 x 20 mm T 12.5 A H / 250 V	Schurter 0001.2515 Siba 179200.12,5 or similar produced by other manufacturers

The symbol for the fuse is **FA**. You will find the exact position on the sticker located on the connection plate of the DLT-V83.

DC connection cable (power supply cable)



Fig. 5.6: DC connection cable, original Advantech



WARNING

Hazardous voltage

Use only original power supply cables from Advantech. Advantech power cables meet the specific requirements for low-temperature flexibility, UV resistance, oil resistance, etc. If other power cables are used, the user/operator of the Industrial Computer is solely responsible for any resulting damage.

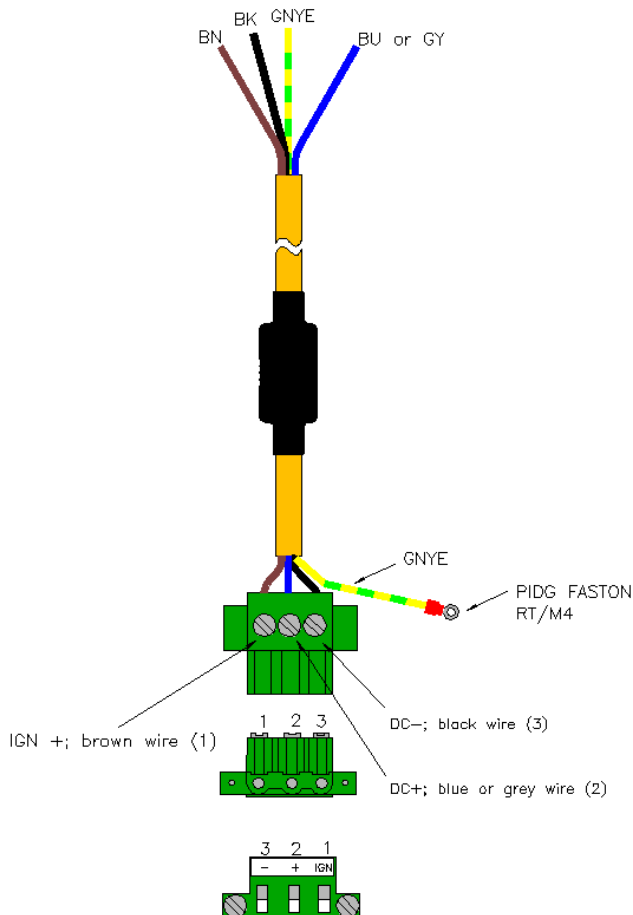


Fig. 5.7: DC connection cable assignment - drawing

5.2.2. Integrated AC power supply unit

An integrated, electrically isolated AC power supply unit is available exclusively for the **DLT-V8315** (optional).

The power is connected to the AC power supply unit on the underside of the device using an angled power connector for non-heating apparatus.

The cable of the angled power connector is equipped with an On/Off-switch for the power grid.



WARNING

Hazardous voltage

Use only original power supply cables from Advantech. Advantech power cables meet the specific requirements for low-temperature flexibility, UV resistance, oil resistance, etc. If other power cables are used, the user/operator of the Industrial Computer is solely responsible for any resulting damage.

AC power supply connection

Connector for non-heating apparatus to IEC 320, 3-pin

External view of the connector:

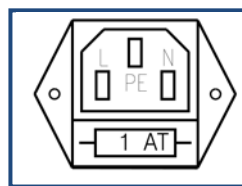


Fig. 5.8: AC power connector with detail view

Power supply, power consumption, power supply unit fuses

Power supply, power consumption	
AC power supply unit, internal, Type: AC-4	Electrically isolated
Rated voltage	100 to 240 VAC
Voltage range	85 to 264 VAC
Input frequency	50/60 Hz
Bridgeable power failures	Typically 22 ms at U _{in} = 115 VAC
Maximum output power	60 W
Rated current	1 A max.
Power consumption: DLT-V8315 with Intel® Atom™ D525 CPU	Typically 30 W
Power consumption: DLT-V8315 with Intel® Core™ i5-4300U CPU and Intel® Celeron® 2980U CPU	Typically 40 W

Power supply unit fuses		
<i>Power supply unit</i>	<i>Fuse type</i>	<i>Example</i>
AC- 4	5 x 20 mm T 1.0 A H / 250 V	Bussman S505-1-R Littelfuse 0215 001. Schurter 0001.2504 Siba 179200.1 or similar produced by other manufacturers

The symbol for the fuse is **FA**.

You will find the exact position on the sticker located on the connection plate of the DLT-V83.

Measurement results of the power consumption according to ErP

Test results	
Idle Mode	24.22 W
Sleep Mode	0.91 W
Soft-Off-Mode (S5)	0.91 W
Lowest Power State	0.00 W (with special connection cable)
Total Energy Consumption (ETEC)	90.07

To facilitate achieving the lower power state:

⇒ Set the switch of the Advantech power supply cable to **Off**.

Test conditions		
	<i>Required</i>	<i>Actual</i>
Input voltage	230 (±1 %) V a.c.	229.82 – 230.05 V
THD	< 2 %	< 2 %
Frequency	50 Hz (±1 %) 5	0 Hz
Ambient temperature	(23 ±5) °C	23.3°C
Ambient humidity	10 to 80 %	31 %RH
Ambient light	(250 ±50) Lux	/ (no automatic display luminance control)
Power analyzer used	N4L type PPA1530 (SIQ ID 503; Calibration valid till 2015-07-01)	

6. Technical data on radio modules

NOTICE: Property damage

DLT-V83 may only be operated with the radio modules described in the following section.

6.1. Identification of the equipment variants

The DLT-V83 offers numerous radio equipment variants for WLAN, WWAN, GNSS and Bluetooth. To identify the variant installed in your device, proceed as follows:

- Read off the FCCID on the device name plate/label and compare with the technical data on the following pages.
- Open the Device Manager to determine the name of the radio card, for example

The radio equipment variants for WLAN, WWAN, GNSS and Bluetooth are available as options and are not included in the standard scope of delivery of the DLT-V83.

6.2. Radio cards



WARNING

Only the manufacturer and its authorized service centers may install/remove radio cards.

Radio cards are located inside the devices and are not accessible from the outside. Only the manufacturer and its authorized service centers may open the device and install/remove it.

6.2.1. Available radio cards for WLAN

SUMMIT/LAIRD SDC-PE15N	
Card type	WLAN PCIe Full-Mini Card
Technology	WLAN IEEE 802.11 a/b/g/n
FCCID	TWG-SDCPE15N
IC ID	6616A-SDCPE15N
Band 1: WLAN 2.4 GHz	
Frequency range	2400 to 2485 MHz
Frequency band ETSI Europe	2.4 GHz to 2.483 GHz
Channels available	1 to 13
Supported standards	WLAN IEEE 802.11 a/b/g/n
Maximum TX power:	100 mW / 20 dBm
Band 2: WLAN 5 GHz	
Frequency range	5150 to 5875 MHz
Frequency band ETSI Europe	5.15 GHz to 5.35 GHz 5.47 GHz to 5.725 GHz
Channels available	36 to 165
Supported standards	WLAN IEEE 802.11 a/n
Maximum TX power	100 mW / 20 dBm

SPARKLAN WPEQ-261ACN(BT)	
Card type	WLAN PCIe Half-Mini Card
Technology	WLAN IEEE802.11 a/b/g/n/ac Bluetooth (both supported via a single antenna)
FCCID	RYK-261ACNBT
IC ID	6158A-261ACBT
Band 1: WLAN 2.4 GHz	
Frequency range	2400 to 2485 MHz
Frequency band ETSI Europe	2.4 GHz to 2.483 GHz
Channels available	1 to 13
Supported standards	WLAN IEEE802.11 a/b/g/n/ac Bluetooth (both supported via a single antenna)
Maximum TX power	100 mW / 20 dBm
Band 2: WLAN 5 GHz	
Frequency range	5150 to 5875 MHz
Frequency band ETSI Europe	5.15 GHz to 5.35 GHz 5.47 GHz to 5.725 GHz
Channels available	36 to 165
Supported standards	WLAN IEEE802.11 a/b/g/n/ac
Maximum TX power	100 mW / 20 dBm

6.2.2. Available Radio cards for WWAN

USA: SIERRA WIRELESS MC8090	
Europe: SIERRA WIRELESS MC8092	
Card type	WWAN PCIe Full-Mini Card
Technology	WWAN 3G
FCCID	N7NSL8090

Band	Frequencies	Conducted Tx Power	
		Average	Notes
GSM Bands			
GSM 850	TX: 824 to 849 MHz	+33 ± 2 dBm	GMSK, connectorized (Class 4)
EGSM 900	TX: 880 to 915 MHz	+33 ± 2 dBm	GMSK, connectorized (Class 4)
DCS 1800	TX: 1710 to 1785 MHz	+30 ± 2 dBm	GMSK, connectorized (Class 1)
PCS 1900	TX: 1850 to 1910 MHz	+30 ± 2 dBm	GMSK, connectorized (Class 1)

USA: QUECTEL EC25A	
Europe: QUECTEL EC25E	
Card type	WWAN PCIe Full-Mini Card
Technology	WWAN 2G, 3G, 4G cellular bands and GNSS
FCCID	FCC ID: XMR201605EC25A (valid for the EC25-A variant)
Maximum transmitting power	Class 3 (23dBm±2dB) for LTE FDD Class 3 (23dBm±2dB) for LTE TDD Class 3 (24dBm+1/-3dB) for TD-SCDMA Class 3 (24dBm+1/-3dB) for WCDMA Class E2 (27dBm±3dB) for EDGE 850/900MHz Class E2 (26dBm+3/-4dB) for EDGE 1800/1900MHz Class 4 (33dBm±2dB) for GSM 850/900MHz Class 1 (30dBm±2dB) for GSM 1800/1900MHz

6.3. Antennas

6.3.1. WLAN antenna diversity, low profile IEEE 802.11 a/b/g/n

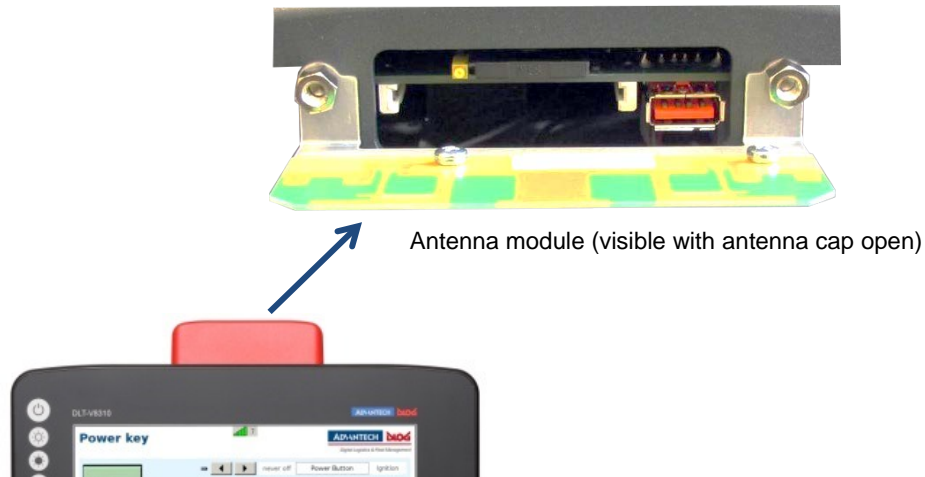


Fig. 6.1: WLAN antenna IEEE 802.11 a/b/g/n and antenna module (optional)

Technical data	
Application	WLAN IEEE 802.11 a/b/g/n Dual Band Diversity
WLAN frequency ranges	Band 1: 2400 to 2485 MHz Band 2: 5150 to 5875 MHz
Number of antennas	2
Available colors	Red, gray, blue
Type	Omnidirectional antenna
Antenna gain	Max. 5 dBi (without loss through the cable)
Impedance	50 Ω
Polarization	Vertical/horizontal
Maximum transmitting power	100 mW / 20 dBm
Compatible Radio card:	SUMMIT/LAIRD SDC-PE15N (see section 6.2.1 Available radio cards)

6.3.2. WLAN antenna IEEE 802.11 a/b/g/n/ac



Fig. 6.2: WLAN antenna IEEE 802.11 a/b/g/n/ac and antenna module (optional)

Technical data	
Application	WLAN a/b/g/n/ac Dual Band with MRC Bluetooth (integrated via Radio card)
WLAN frequency range	Band 1: 2400 to 2485 MHz Band 2: 5150 to 5850 MHz
Bluetooth features	See section 6.4.1 <i>Bluetooth</i>
Number of antennas	2
Available color	Red
Type	Omnidirectional antenna
Antenna gain	Max. 4.44 dBi (without loss through the cable)
Impedance	50 Ω
Polarization	Vertical/horizontal
Maximum transmitting power	100 mW / 20 dBm
Compatible Radio card:	SPARKLAN WPEQ-261ACN(BT) (see section 6.2.1 <i>Available radio cards</i>)

6.3.3. WLAN, WWAN 3G



Fig. 6.3: WLAN, WWAN 3G antenna (optional)

Technical data	
Application	WLAN IEEE 802.11 a/b/g/n Dual Band Diversity WWAN 3G
WLAN frequency range	Band 1: 2400 to 2485 MHz Band 2: 5150 to 5875 MHz
WWAN frequency range	GSM900: 880 to 960 MHz GSM1800: 1710 to 1880 MHz GSM1900: 1850 to 1990 MHz UMTS: 1920 to 2170 MHz
Number of antennas	4
Available colors	Red, gray
Type	Omnidirectional antenna
Antenna gain	Max. 3 dBi (without loss through the cable)
Impedance	50 Ω
Polarization	Vertical/horizontal
Maximum transmitting power	WLAN: 100 mW / 20 dBm WWAN: 250 mW / 24 dBm
Compatible Radio card:	SUMMIT/LAIRD SDC-PE15N (see section 6.2.1 Available radio cards)
Compatible WWAN Radio card:	USA: SIERRA WIRELESS MC8090 Europe: SIERRA WIRELESS MC8092 (see section 6.2.2 Available Radio cards)

6.3.4. WLAN, WWAN, LTE 4G antenna (Multiband)

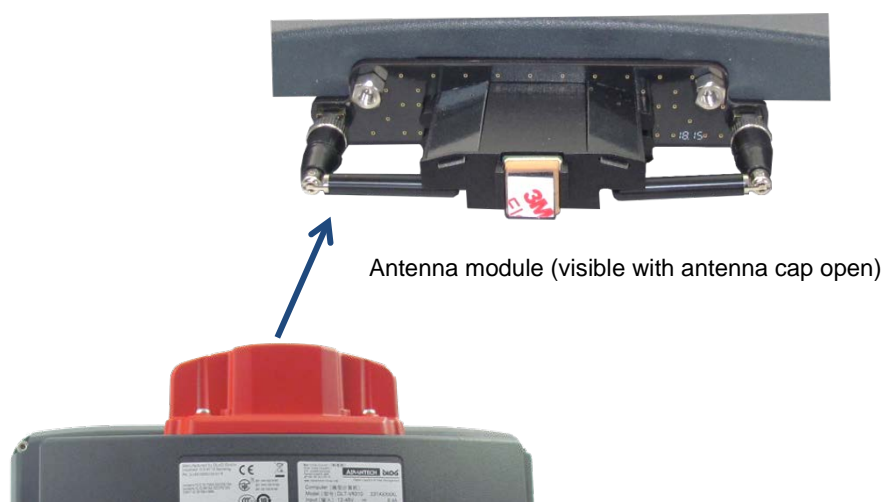


Fig. 6.4: DLT-V83 rear view with WLAN, WWAN, LTE 4G antenna (Multiband)

Technical data	
Application	WLAN IEEE 802.11 ac/a/b/g/n Dual Band with MRC WWAN 4G Bluetooth 4.2+HS
WLAN frequency range	Band 1: 2400 to 2485 MHz Band 2: 5150 to 5875 MHz
WWAN frequency bands with EC25-E	FDD LTE: B1/B3/B5/B7/B8/B20 TDD LTE: B38/B40/B41 WCDMA: B1/B5/B8 GSM: 900/1800
WWAN frequency bands with EC25-A	FDD LTE: B2/B4/B12 WCDMA: B2/B4/B5
Bluetooth features	See section 6.4.1 <i>Bluetooth</i>
Number of antennas	4
Available color	Red
Type	Omnidirectional antenna
Antenna gain	WLAN: Max. 5.8 dBi WWAN: Max. 3.5 dBi
Impedance	50 Ω
Polarization	Vertical/horizontal
Maximum transmitting power	WLAN: 100 mW / 20 dBm WWAN: Class 3 (23dBm \pm 2dB) for LTE FDD Class 3 (23dBm \pm 2dB) for LTE TDD Class 3 (24dBm+1/-3dB) for TD-SCDMA Class 3 (24dBm+1/-3dB) for WCDMA Class E2 (27dBm \pm 3dB) for EDGE 850/900MHz Class E2 (26dBm+3/-4dB) for EDGE 1800/1900MHz Class 4 (33dBm \pm 2dB) for GSM 850/900MHz Class 1 (30dBm \pm 2dB) for GSM 1800/1900MHz
Compatible WLAN card:	SPARKLAN WPEQ-261 ACN (BT) (see section 6.2.1 <i>Available radio cards</i>)

Compatible WWAN card:	USA: QUECTEL EC25A Europe: QUECTEL EC25E (see section 6.2.2 Available Radio cards)
-----------------------	--

6.3.5. External WLAN antenna IEEE 802.11 a/b/g/n



Fig. 6.5: External WLAN antenna (optional)

Technical data	
Application	WLAN IEEE 802.11 a/b/g/n Dual Band
Mounting location	For detached mounting, e.g. on the roof of the forklift
WLAN frequency range	Band 1: 2400 to 2485 MHz Band 2: 5150 to 5875 MHz
Number of antennas	1
Type	Omnidirectional antenna
Antenna gain	Band 1: Max. 4 dBi (without loss through the cable) Band 2: Max. 6.5 dBi (without loss through the cable)
Impedance	50 Ω
Polarization	Vertical/horizontal
Dimensions	Ø 86 x 43 mm (Ø 3.39" x 1.69")
Weight	0.3 kg (0.66 lbs)
Connector labeling	N-type or TNC N, Jack, female, bottom RSMA plug for RSMA socket on the terminal
Scope of delivery	3 m antenna cable
Maximum transmitting power	100 mW / 20 dBm
Corresponding Radio cards:	SUMMIT/LAIRD SDC-PE15N SPARKLAN WPEQ-261 ACN (BT) (see section 6.2.1 Available radio cards)

6.3.6. External WWAN antenna 3G



Fig. 6.6: External 3G WWAN antenna (optional)

Technical data	
Application	WWAN 3G technology
Mounting location	For detached mounting, e.g. on the roof of the forklift
WWAN frequency range Transmitting (TX)	AMPS: 824 to 849 MHz GSM 900: 880 to 915 MHz GSM 1800: 1710 to 1785 MHz GSM 1900: 1850 to 1910 MHz UMTS: 1900 to 2025 MHz
WWAN frequency range Receiving (RX)	AMPS: 869 to 894 MHz GSM 900: 925 to 960 MHz GSM 1800: 1805 to 1880 MHz GSM 1900: 1930 to 1990 MHz UMTS: 2110 to 2170 MHz
Number of antennas	1
Type	Omnidirectional antenna
Antenna gain	Typically 0 dBi (5.1 dBi)
Impedance	50 Ω
Polarization	Vertical/horizontal
Dimensions	33 mm x 89 mm
Maximum transmitting power	250 mW / 24 dBm
Compatible WWAN card	USA: SIERRA WIRELESS MC8090 Europe: SIERRA WIRELESS MC8092 (see section 6.2.2 Available Radio cards)

6.3.7. External WWAN antenna 2G, 3G, 4G



Fig. 6.7: External WWAN antenna (optional)

Technical data	
Application	WWAN 2G, 3G, 4G cellular bands
Mounting location	For detached mounting, e.g. on the roof of the forklift
Number of antennas	1
Type	Omnidirectional antenna
Antenna gain	Typically 2.2 dBi
Impedance	50 Ω
Polarization	Vertical
Dimensions	Height 79.45 mm Diameter 42 mm
Cable length	3 m
IP protection	IP67 and IP69K
Max. transmitting power of antenna	Class 3 (23dBm \pm 2dB) for LTE FDD Class 3 (23dBm \pm 2dB) for LTE TDD Class 3 (24dBm+1/-3dB) for TD-SCDMA Class 3 (24dBm+1/-3dB) for WCDMA Class E2 (27dBm \pm 3dB) for EDGE 850/900MHz Class E2 (26dBm+3/-4dB) for EDGE 1800/1900MHz Class 4 (33dBm \pm 2dB) for GSM 850/900MHz Class 1 (30dBm \pm 2dB) for GSM 1800/1900MHz
Compatible WWAN card:	USA: QUECTEL EC25A Europe: QUECTEL EC25E (see section 6.2.2 Available Radio cards)

6.4. Bluetooth (optional)

The DLT-V83 offers the following Bluetooth options:

6.4.1. Bluetooth integrated: WLAN card SPARKLAN WPEQ-261ACN (BT)

Requirement: Use of the WLAN card SPARKLAN WPEQ-261ACN (BT)

Technical data	
Type	Bluetooth 4.2+HS
Standards	V4.2, V4.0 LE, V3.0+HS, V2.1+EDR
Transmission rate	1 Mbps, 2 Mbps, up to 3 Mbps
Compatible operating system	WES7 Win7Pro WE8S Win8.1 ind. Pro Linux optional

6.4.2. Micro Bluetooth adapter (USB stick)

The optional micro Bluetooth adapter permits the WLAN connection between the DLT-V83 and Bluetooth devices.

If the Bluetooth option was ordered, this adapter is already integrated into the Service USB interface under the antenna.

Technical data	
Type	USB adapter Bluetooth 2.0
Transmission rate	EDR transmission rate up to 2.1 Mbit/s
General range	10 m
Class	Class 2 Micro Size
Compatibility	Compatible with USB 2.0/1.1
	Supports A2DP stereo transmission
Compatible operating system	Windows 7 Windows 8 Windows 10 Linux optional
Maximum transmitting power	2.5 mW

6.5. GPS receiver external (optional)

With the optional GPS receiver the DLT-V83 can be used for GPS navigation.

The GPS receiver has an integrated antenna for position data of the Global Positioning System (GPS) and communicates with the DLT-V83 via USB interface.

We recommend using only a GPS receiver approved by Advantech.



Fig. 6.8: External GPS receiver (optional)

Installation

The installation CD supplied with the GPS receiver includes installation files and a multi-lingual manual.

⇒ Please read the additional information in the manual about the GPS receiver.

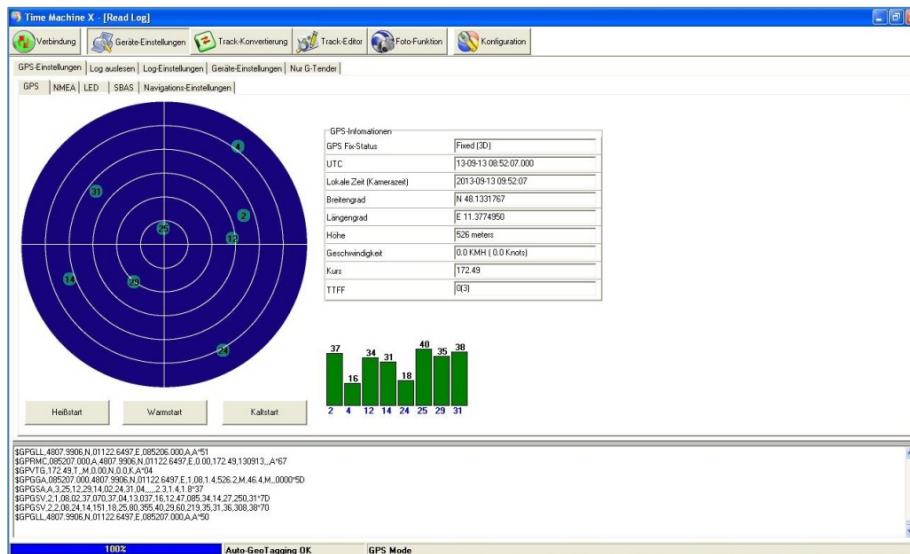


Fig. 6.9: Ext. GPS receiver, display example during installation

7. Interfaces, connectors

7.1. Integrated

7.1.1. LCD interface

VGA Controller

Intel® Core™ i5-4300U	Intel® Celeron® 2980U	Intel® Atom™ D525
Intel® HD graphics 4400 Max. dynamic graphic frequency 1.1 GHz Graphic Memory Intel® DVM T 5.0 Up to 1024 MB video memory supported 3D/HW acceleration DX 11.2/12, OGL 4.3, OCL 1.2 support Intel® Quick-Sync-Video Up to 24 bit color depth, depending on which LCD is used	Intel® HD graphics Max. dynamic graphic frequency 1.0 GHz Graphic Memory Intel® DVM T 5.0 Up to 1024 MB video memory supported 3D/HW acceleration DX 11.2/12, OGL 4.3, OCL 1.2 support No Intel® Quick-Sync-Video Up to 24 bit color depth, depending on which LCD is used	Intel® Gen 3.5 DX9, MPEG2 hardware decoder Shared Memory architecture Up to 24 bit color depth, depending on which LCD is used

7.1.2. Touch interface

Resistive touch controller	12-bit touch controller for touchscreens with USB interface
PCT touch controller	10": X21-Y28 channel PCT controller with USB interface and Advantech-specific firmware; 12" and 15": X52-Y40 channel PCT controller with USB interface and Advantech-specific firmware

7.2. External

7.2.1. Serial interfaces

COM1	Max. 115,200 Baud (16550A compatible, 16 byte FIFO), supports EIA-232-E on external 9-pin D-Sub connection ESD Level 4 protected (according to EN 61000-4-2) Optional: COM1 with 5 V or 12 V
COM2	Max. 115,200 Baud (16550A compatible, 16 byte FIFO), supports EIA-232-E on external 9-pin D-Sub connection ESD level 4 protected (acc. to EN 61000-4-2) Optional: COM2 as a galvanically isolated EIA-422/485

7.2.2. USB, Service-USB

USB connection, for example for mouse, keyboard, USB stick	3 x USB 2.0 Host USB 2.0 HiSpeed Fused at 0.5 A per channel ESD Level 4 protected (according to EN 61000-4-2)
Service USB e.g. for mouse, keyboard, USB stick	1 x USB 2.0 Host, Service-connection under antenna cap USB 2.0 HiSpeed Fused at 0.5 A per channel ESD level 4 protected (acc. to EN 61000-4-2)

7.2.3. Audio interface for handset

Audio handset-connection	Microphone input
	Audio out max. 2 W @ 8 Ohm
	ESD Level 3 protected (according to EN 61000-4-2)

7.2.4. Network interface

CPU Intel® Core™ i5-4300U and Intel® Celeron® 2980U	
Network controller	Intel® i218LM Gigabit Ethernet 10/100/1000 MB/s
Network connection	RJ45 connector Integrated carrier Two integrated status LEDs

Intel® Atom™ D525	
Network controller	Intel® 82567V Gigabit Ethernet 10/100/1000 MB/s
Network connection	RJ45 connector Integrated carrier Two integrated status LEDs

7.3. Serial interfaces - Functions

The DLT-V83 is equipped with two externally accessible serial interfaces COM1 and COM2. Resources for the serial interfaces are pre-defined in the system architecture and automatically managed by the BIOS.

7.3.1. COM1 as a voltage source (optional)

The COM1 interface can optionally supply to externally connected equipment with +5 V or +12 V of power. The voltages are protected by internal fuses and may not exceed a continuous consumed current of 1 A at +5 V resp. +12 V. Depending on the connected devices, the maximum current consumption may be significantly lower.

7.3.2. COM2 as EIA-422/485 (optional)

A basic function (RX, TX) EIA-422/485 interface can be integrated optionally into the DLT-V83 as serial interface.

Pin assignment 4xx:

Pin	Signal	Pin	Signal
1	nc	6	nc
2	nc	7	nc
3	RX-	8	RX+
4	TX-	9	TX+
5	GND		

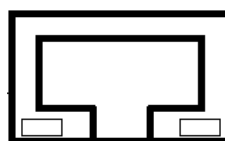
7.3.3. Network adapter (10/100/1000)

The DLT-V83 is equipped with a 10/100/1000 Mbit network adapter with 10/100/1000 Mbit per second. This adapter can be accessed via the bottom of the device and offers an RJ45 connection jack. The RJ45 connection port has two integrated status LEDs and are assigned as follows:

Fig. 7.1: RJ45 network port

Left LED (green)

LED off: no connection or 10 MBit
LED on: Connection with 100 or 1000 MBit



Right LED (orange):

LED off: no activity
LED flashing: Activity

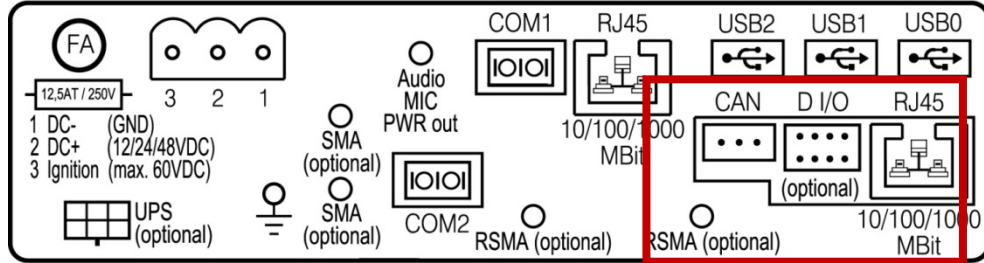
Problems with data transmission via LAN/Ethernet

If problems occur during data transmission over LAN/Ethernet (e.g. data is lost or not detected), the cause of these problems may be a cable which is too long. Depending on the cable layout and interference from the environment, it may be impossible to use the cable length of 100 m given in the specification (IEEE 802.3 standard). The solution here is the use of a shorter cable.

7.3.4. CAN, digital I/O and second Ethernet interface (optional)

CAN, Digital In/Out and LAN Ethernet is available as an optional expansion interface package. At the lower right in the illustration is the position of these interfaces on the DLT-V83 connector panel:

Fig. 7.2: CAN, Digital In/Out and second Ethernet interface



CAN interface

The CAN interface is galvanically separated from the overall system.

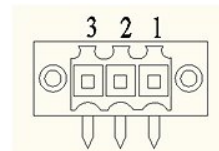
A 120 Ω terminating resistor is mounted on the pcb.

A matching driver is integrated in the operating system. An API description is available upon request.

Contact your Advantech sales representative if necessary.

Fig. 7.3: Pin assignment of CAN interface

pin	signal
1	CAN_H
2	SHIELD
3	CAN_L



Matching connectors (examples):

Manufacturer	Series	Order no.	Description
Weidmüller	BL 3.5/180F	1606650000	BL 3.50/03/180F SN OR BX
Weidmüller	BL 3.5/180F	1615790000	BL 3.50/03/180F SN BK BX
Weidmüller	BL 3.5/180F	1740721001	BL 3.50/03/180F SN OR BX PRT
Weidmüller	BL 3.5/180	1597370000	BL 3.50/03/180 SN OR BX
Weidmüller	BL 3.5/90	1638790000	BL 3.50/03/90 SN BK BX

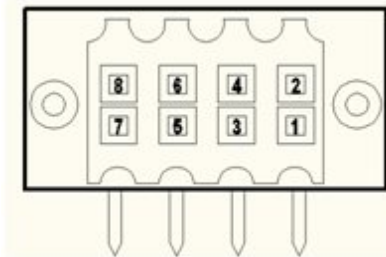
Digital I/O interface

The Digital I/O interface is galvanically separated from the overall system. A matching driver is integrated in the operating system. An API description as well as sample application are available upon request. Contact your Advantech sales representative if necessary.

Pin assignment:

Pin	Signal	
1	DI1+	Provides 12 VDC / max. 8 mA
2	DI1-	Input DI1 -> selectable up to max. 12 VDC / 100 Hz filter integrated
3	DI2+	Provides 12 VDC / max. 8 mA
4	DI2-	Input DI1 -> selectable up to max. 12 VDC / 100 Hz filter integrated
5	DIO_GND	GND Potential for Digital I/O application
6	DO1	Output 1: supplies 12 VDC / 20 mA
7	DO2	Output 1: supplies 12 VDC / 20 mA
8	DO3	Output 1: supplies 12 VDC / 20 mA

Fig. 7.4: Digital I/O interface pin position



Matching connectors (examples):

Manufacturer	Series	Order no.	Description
Weidmüller	B2L 3.50F	1748180000	B2L 3.50/08/180F SN BK BX
Weidmüller	B2L 3.50	1847530000	B2L 3.50/08/180 SN OR BX PRT
Weidmüller	B2L 3.50	1024270000	B2L 3.50/08/180 SN BK BX PRT

Network adapter 2, Ethernet (10/100/1000)

The DLT-V83 is equipped with an optional network adapter with 10/100/1000 Mbit per second. This adapter is accessible via the underside of the device and features a RJ45 socket.

The RJ45 connection port has two integrated status LEDs and are assigned as follows:

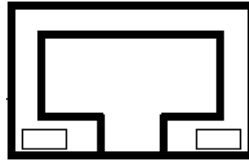
Fig. 7.5: Optional RJ45 network socket of the DLT-V83

Left LED (green)

LED off: no connection
or 10/100 MBit

LED on: Connection with 1000 MBit

LED flashing: Activity 1000 MBit



Right LED (orange):

LED off: no connection
or 1000 MBit

LED on: Connection with 10 or
100 MBit

LED flashing: Activity 10/100 MBit

7.3.5. Serial interface barcode scanners

The serial wedge is integrated as standard in WES 2009 and Windows XP Professional only.

Please note that you have to configure the scanner correctly to EIA-232-E and the above set BAUD rate following the scanner manufacturer's guidelines. Otherwise the software wedge will not function properly.

To activate the integrated scanner software wedge:

- ⇒ Open the **Start** menu and navigate to **Settings | Control Panel | Accessibility**.
- ⇒ Select the **General** tab.
- ⇒ Select **Support accessibility** option.
- ⇒ Click **Settings**.
- ⇒ Configure the desired COM1 interface and BAUD rate.
- ⇒ Confirm the change with **OK**.
- ⇒ Click **OK** again to apply the changes.

7.3.6. Tips & tricks

Note that according to the EIA-232-E specification, the maximum cable length is 15 m at 19,200 bps.

However, according to EIA-422-A for use of a twisted pair line and correct termination 1200 m at up to 100 kbps is possible. For a data rate of 1 Mbps and a high-quality connection cable, approx. 400 m cable lengths are still possible. Frequent causes of malfunctions for EIA-232-E connections are the formation of ground loops. If both end devices establish a ground connection via EIA-232-E but do not share the same ground potential in their power supply circuits, then compensation currents may result; this is particularly noticeable with long cables.

These compensation currents, which are also present at the ground point of the EIA-232-E connection, may significantly degrade signal quality and effectively stop the data flow. In challenging environments, electrically-isolated connections (via the RS-422/485 option) or external converter from EIA-232-E according to EIA-422/485 are strongly recommended.

7.4. Connections under the cable cover

7.4.1. DC devices: connections, expansion interfaces

The symbol for the fuse is **FA**.

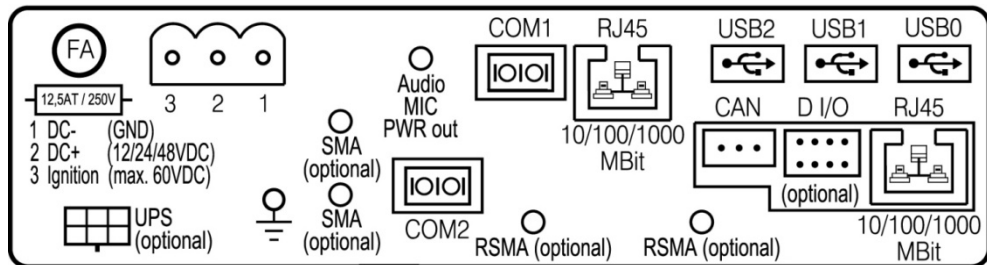


Fig. 7.6: DC device external connections with optional expansion interfaces

Pin assignment (standard)	
Power supply	12/24/48 VDC nominal
UPS (optional)	Uninterruptible power supply (UPS)
2 x SMA (optional)	WWAN/GPS
Audio MIC PWR out	Voice Kit
COM1, COM2	Serial interfaces
2 x RSMA (optional)	Remote WLAN antenna(s)
RJ45	LAN Ethernet 10/100/1000 MBit/s
USB2, USB1, USB0	USB 2.0 interfaces (HI-SPEED™), bootable

Expansion interfaces package 1 (optional)	
D I/O	Digital In/Out
RJ45	LAN Ethernet 10/100/1000 MBit/s

Expansion interfaces package 2 (optional)	
CAN	CAN interface
D I/O	Digital In/Out
RJ45	LAN Ethernet 10/100/1000 MBit/s

7.4.2. AC devices (DLT-V8315 only): connections, expansion interfaces

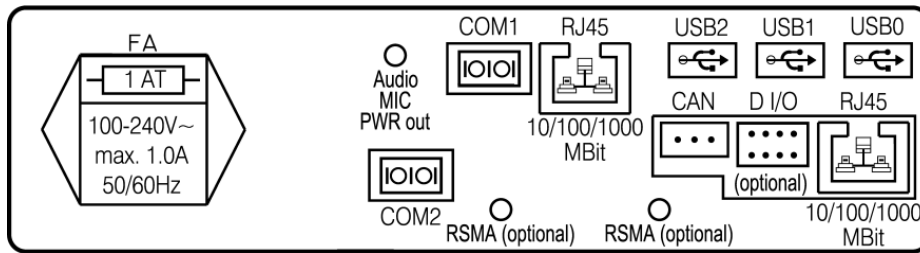


Fig. 7.7: AC device external connections with optional expansion interfaces

Pin assignment (standard)	
Power supply DLT-V8315	100 to 240 VAC
Audio MIC PWR out	Voice kit
COM1, COM2	Serial interfaces
2 x RSMA (optional)	Remote WLAN antenna(s)
RJ45	LAN Ethernet 10/100/1000 Mbps
USB2, USB1, USB0	USB 2.0 interfaces (HI-SPEED™), bootable

Expansion interfaces package 1 (optional)	
D I/O	Digital I/O
RJ45	LAN Ethernet 10/100/1000 Mbps

Expansion interfaces package 2 (optional)	
CAN	CAN interface
D I/O	Digital I/O
RJ45	LAN Ethernet 10/100/1000 Mbps

7.5. Connections underneath the antenna/protective cap

The DLT-V83 offers the following interfaces underneath the antenna or underneath the protective cap (depending on the device version ordered):

- Service USB slot
- CFast slot
- Mini SIM card slot

NOTICE: Property damage

These interfaces may only be used by qualified expert personnel and only for the duration of service works (e.g. software updates, card replacement).

Example for antenna on the device:



Fig. 7.8: Example of antenna, type 4 in 1

Example for protective cap on the device (if no antenna is present):



Fig. 7.9: Protective cap examples

7.5.1. Information on service USB, CFast and Mini SIM card slot

Service USB slot	<p>Plug connector with increased pull-out force (to fulfill the specific shock and vibration requirements of the DLT-V83).</p> <p>Exercise special care when removing and plugging in USB sticks.</p>
CFast slot	<p>Insert CFast card precisely into the slot guide rails. Otherwise, there is a risk of the CFast card dropping into the device when inserting it.</p>
Mini SIM card slot for WWAN	<p>Insert/remove mini SIM card</p> <ul style="list-style-type: none"> – Press the yellow unlock button next to the mini SIM card slot. The card opens and extrudes slightly from the device. – Pull the card tray completely out of the device. The mini SIM card can now be inserted or removed. – Carefully push the card tray in again. <p>NOTICE: Push in the card tray exactly at the location provided. Otherwise, there is a risk of the tray and mini SIM card dropping into the device when pushing in the tray.</p>

8. Open/close antenna (or protective cap)

The DLT-V83 is normally equipped with an antenna for radio operation. Devices without radio operation have no antenna and instead have what is known as a "protective cap".

The following interfaces are located underneath the antenna or protective cap:

- Service USB
- CFast
- Mini SIM card slot

8.1. Avoid Property damage

NOTICE: Property damage

Protective caps or antennas:

- are only permitted to be removed for servicing purposes, e.g. to install software updates.
- are only permitted to be removed by qualified expert personnel.

No objects or liquids are permitted to enter the opened DLT-V83.

The device is only permitted to be operated again once the protective cap or antenna is properly sealed again; only then is the protection class guaranteed.

When opening and closing, proceed as described in the sections below.

8.1.1. Disconnecting from the electric power source

- Switch off the DLT-V83 before the protective cap or antenna is removed.
- Only insert/remove the mini SIM card, CFast card and USB stick when the device has been completely de-energized.

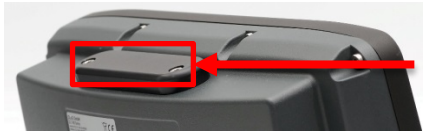
Please note: For DLT-V83 devices with integrated UPS the device may be in operation despite the disconnecting device being actuated, since it is supplied with power by the UPS. Likewise, the peripherals that are supplied by the device are also not currentless as long as the DLT-V83 is being provided with power by the UPS.

8.1.2. Tools required

To open the following component:	Use this tool:
Protective cap	– 3mm Allen wrench
4 in 1 multi-band antenna	– Torx screwdriver, Tx20
Low profile WLAN antenna (low)	– Allen key (size 7)
All high profile antenna (high)	– Allen key (size 3)

8.2. Open/close protective cap

Open protective cap:



- ⇒ Unfasten both screws on the protective cap using a 3mm Allen wrench.
- ⇒ Remove the protective cap from the device. The interfaces are now accessible.

Close protective cap:

- ⇒ Place the protective cap back onto the DLT-V83.
- ⇒ Tighten both screws (1 Nm torque).

8.3. Open/close antenna

8.3.1. WLAN antenna IEEE 802.11 a/b/g/n

Open antenna:

NOTICE: Property damage

Remove the antenna extremely carefully from the device, as it is secured using thin connection cables onto the Radio card(s) in the interior of the device.

The connection cables can be detached from the antenna and the radio card, meaning WLAN operation is no longer guaranteed.

- ⇒ Unfasten both screws on the antenna.
Tool: Torx screwdriver, Tx20
- ⇒ Lift the antenna carefully to avoid pulling on the connection cables (raise by a maximum of 2 to 3 cm).



- ⇒ Do not pull the connection cables too far out of the device, and do not allow them to get caught or severed.

Fig. 8.1: WLAN antenna unscrewed

Close antenna:

- ⇒ Place the antenna back onto the DLT-V83.
- ⇒ Take care not to pinch the connection cables when doing this. The antenna sealing must not be damaged; it must be seated correctly in the groove.
- ⇒ Tighten the two screws of the antenna again (1 Nm torque).

8.3.2. WLAN antenna IEEE 802.11 a/b/g/n/ac

Open antenna:



Fig. 8.2: Open WLAN antenna IEEE 802.11 a/b/g/n/ac

- ⇒ Unfasten both screws on the antenna. Tool: Allen key (size 3)
- ⇒ Remove the antenna from the device.



Fig. 8.3: WLAN antenna IEEE 802.11 a/b/g/n/ac opened

Service USB, CFast and mini SIM card slot are now accessible.

For details, see section 7.5.1 *Information on service USB, CFast and Mini SIM card slot.*

Close antenna:

- ⇒ Place the antenna back onto the DLT-V83.
- ⇒ Tighten both screws (1 Nm torque).

8.3.3. WLAN, WWAN 3G antenna

Open antenna:



Fig. 8.4: WLAN, WWAN 3G antenna

- ⇒ Unfasten both screws on the antenna. Tool: Allen key (size 3)
- ⇒ Remove the antenna from the device.

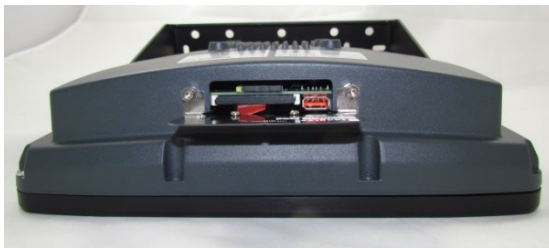


Fig. 8.5: WLAN, WWAN 3G antenna opened

Service USB, CFast and mini SIM card slot are now accessible.
For details, see section 7.5.1 *Information on service USB, CFast and Mini SIM card slot.*

Close antenna:

- ⇒ Place the antenna back onto the DLT-V83.
- ⇒ Tighten both screws (1 Nm torque).

8.3.4. WLAN, WWAN antenna (multi-band) LTE 4G

Open antenna:



- ⇒ Unfasten both screws on the antenna cap.
Tool: Torx screwdriver, Tx20
- ⇒ Remove the antenna from the device.

Fig. 8.6: Open WLAN, WWAN antenna

The antenna module is located underneath the antenna cap:

NOTICE: Property damage

Remove the antenna module extremely carefully from the device, as it is secured using thin connection cables onto the Radio card(s) in the interior of the device.

The connection cables can be detached from the antenna module and the radio card, meaning WLAN operation is no longer guaranteed.



- ⇒ Unfasten both bolts on the antenna module.
Tool: Nut driver.
- ⇒ **Notice: Property damage**
Raise the antenna module exceptionally carefully (connection cables!)

Fig. 8.7: Open WLAN / WWAN antenna



Service USB, CFast and mini SIM card slot are now accessible.
For details, see section 7.5.1 *Information on service USB, CFast and Mini SIM card slot.*

Fig. 8.8: WLAN, WWAN antenna opened

Fasten antenna module and antenna cap:

- ⇒ Place the antenna module back onto the DLT-V83.
- ⇒ Take care not to pinch or damage the connection cables when doing this.
- ⇒ Tighten the two bolts again (1 Nm torque).

- ⇒ Place the antenna cap back onto the DLT-V83.
- ⇒ Tighten the two screws of the antenna cap again (1 Nm torque).

9. Operating the device

9.1. Safety notes for normal operation, control



WARNING

Personal injury, Property damage and downtimes due to improper operation.

Operators of the DLT-V83 must be trained in the handling of the device.

Users of DLT-V83 with integrated UPS must also be trained in the proper handling of battery packs.

Risk of accident! Personal injury and Property damage caused by using the terminal and driving at the same time.

⇒ Do not operate the DLT-V83 terminal while driving.

Risk of injury and Property damage due to improper deployment location (refueling stations, etc.)

- ⇒ Observe the intended use of the DLT-V83, e.g. not in potentially explosive areas, not in life-supporting facilities.
- ⇒ Turn off the DLT-V83 when you are near gas stations, fuel depots, chemical plants or places where blasting operations take place.
- ⇒ Ensure that the deployment location of the DLT-V83 complies with the permissible environmental conditions.

Personal injury from battery packs: Short-circuit, fire, chemical burns, toxic substances.

The integrated UPS battery packs in the cable cover of the DLT-V83 can ignite if handled improperly (risk of fire), cause chemical burns or release toxic substances.

- ⇒ Handle the cable cover carefully.
- ⇒ Do not allow water or other liquids to come into contact with the device (exercise particular caution with corrosive liquids).
- ⇒ Ensure that no liquids or foreign bodies get into the cable cover.
- ⇒ Provide sufficient ventilation.
- ⇒ Do not allow the device to come into contact with fire or operate it close to sources of heat or fire, open flame or heaters.
- ⇒ Observe the specific IP protection class.
- ⇒ Only use the DLT-V83 within the permitted temperature and humidity range.
- ⇒ Do not subject it to strong impacts and vibrations that exceed what is specified by the class 5M3/5M2 (DIN EN 60721-3-5).

**WARNING****Electric shock due to incomplete switching off of the DLT-V83 with integrated UPS.**

Because of the battery packs, the integrated UPS may still carry current even if the DLT-V83 itself is switched off.

Reason: If the DLT-V83 has been configured to also start without <Power> button and ignition in the "DLoG Config" program, this setting will need to be changed first.

Otherwise, the DLT-V83 will restart after a short pause as long as there is available battery capacity.

To completely switch off the device:

- ⇒ Shut down the DLT-V83 via the operating system function.
- ⇒ Disconnect from the power supply.
- ⇒ Open the cable cover.
- ⇒ Unplug the UPS battery.

Vehicle EMERGENCY-OFF switch does not switch off the DLT-V83 with integrated UPS.

If a DLT-V83 with integrated UPS is installed in a vehicle, the EMERGENCY-OFF switch of the vehicle has no effect on the DLT-V83.

This also applies to the peripherals supplied by the device.

NOTICE: Property damage**Overvoltage on the DLT-V83 when charging the vehicle battery.**

While the vehicle battery is charging:

- The DLT-V83 must be disconnected from the vehicle battery.
- Or it must be ensured that the maximum permitted input voltage of the DLT-V83 is not exceeded.

Charging the integrated UPS correctly.

- ⇒ Do not connect damaged cable covers with battery packs to the DLT-V83; do not charge.
- ⇒ Battery packs become warm while charging; this is normal. However, if they become excessively hot, immediately disconnect the DLT-V83 from the power source.
- ⇒ Do not continue to use the DLT-V83 if you notice an unusual level of heat or an unusual smell during charging.
- ⇒ Provide for sufficient ventilation of the DLT-V83 when charging the battery pack.

Parking vehicles with DLT-V83 devices with the "Screen-Defroster and integrated UPS" equipment combination.

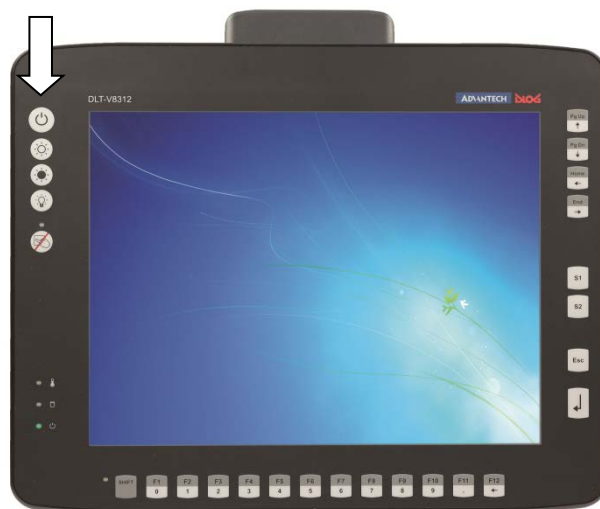
- ⇒ Do not park or store vehicles on which DLT-V83 devices with a Screen-Defroster and an integrated UPS are installed in areas with ambient temperatures below 0°C.
- ⇒ If vehicles on which DLT-V83 devices with a Screen-Defroster and an integrated UPS are installed are parked or stored for a significant length of time, disconnect the DLT-V83 from the vehicle battery.

9.2. Switching the DLT-V83 on/off

Switch the DLT-V83 on and off as follows, depending on the configuration:

- ⇒ Using the <Power> button. Press and hold the <Power> button for 2 seconds.
- ⇒ By applying the supply voltage.
- ⇒ Through the ignition signal of the vehicle.

Fig. 9.1: <Power> button



Time between switching off and on: 10 seconds

After the DLT-V83 has been shut down and switched off, it takes 10 seconds until the device will react to a switch-on signal (<Power> button / ignition).

9.3. Operating the touchscreen

Depending on the device model, the DLT-V83 is equipped with a resistive touchscreen or a projected-capacitive touchscreen with continuous glass front (abbreviated PCT).

TIP: Protective film for resistive touchscreens

Optional protective film is available for the resistive touchscreens.

Details in section *16.12 Protective film for touchscreen (optional)*.

9.3.1. Prevent damage to the touchscreen

Information valid for all touchscreen types, resistive and PCT.

- ⇒ Keep the touchscreen clean.
- ⇒ To not touch the touchscreen with pointed, sharp, rough or hard objects, e.g. ball point pens, writing implements, tools of any kind (e.g. screwdrivers).
- ⇒ Prevent any kind of adhesive applied on the surface.
- ⇒ Ensure that the screen surface is not influenced by high voltages or static electricity.
- ⇒ Do not use excessive force when touching touchscreens, do not hit or press hard.
- ⇒ Do not put the device down with the touchscreen facing down, if necessary, place a clean cloth underneath.

9.3.2. Operating the resistive touchscreen

Operate the resistive touchscreen with:

- Clean, dry fingers.
- Clean, dry, soft gloves.
- Suitable touch stylus (plastic or wood, rounded tip).

9.3.3. Operating the PCT touchscreen

Operate the PCT touchscreen with:

- Clean, dry fingers.
- Clean, dry, thin gloves.
- Suitable touch stylus with capacitive (electrically conductive) tip.

NOTICE: Property damage

Water on the PCT touchscreen can be interpreted as a "touch" and lead to malfunctions.

Multi-touch capability

Depending on the installed operating system type, the PCT touchscreen of the DLT-V83 is multi-touch capable. This means it can detect two touches simultaneously.

9.4. DLT-V83 front keys with resistive touchscreen







9.4.1. Overview of the operating elements on the device front




Fig. 9.2: Example: DLT-V8312 version with 26 front keys











9.4.2. Device with 26 front keys

Left on the device:



Key	Explanation
	<Power> button, switch device on/off
	Manual brightness control: Display brighter
	Manual brightness control: Display darker
	Switch the backlight on/off Note: The DLT-V83 will continue to react to keyboard, mouse and touchscreen inputs even if the backlight is switched off. This means that entries can still be made even when the screen display is not visible.
	Touchscreen activate/deactivate LED on (orange): Touchscreen deactivated LED off: Touchscreen activated
	<Shift> key; if the LED is illuminated, it indicates that the <Shift> is activated

LED	Explanation
	LED (red): Indicates a device temperature outside the normal range.
	LED (green): Indicates access to the flash drive.
	LED (green): Display of available internal supply voltage.






Right on the device:




Key	Explanation
	Page Up / Line Up (switch with <Shift> key)
	Page Down / Line Down (switch with <Shift> key)
	Home / Backwards (switch with <Shift> key)
	End / Forwards (switch with <Shift> key)
	Special keys <S1> and <S2> These keys are configured with the "DLoG Config" program; the associated manual is available on our websites.
	
	<Esc> key
	<Enter> key

Below on the device:



Key	Explanation
	Function keys and numbers 0 to 9, backspace <Shift> pressed: Key function marked in grey is active <Shift> not pressed: Key function marked in white is active.
...	
	The function keys are configured with the "DLoG Config" program, the associated manual is available on our websites.

9.4.3. Device with 5 front keys

Key	Explanation
	<Power> button, switch device on/off
	Manual brightness control: Display brighter
	Manual brightness control: Display darker
	Backlight switch on/off Note: The DLT-V83 will continue to react to keyboard, mouse and touchscreen inputs even if the backlight is switched off.
	Touchscreen activate/deactivate LED on (orange): Touchscreen deactivated LED off: Touchscreen activated

LED	Explanation
	LED (red): Indicates a device temperature outside the normal range
	LED (green): Indicates access to the flash drive
	LED (green): Display of available internal supply voltage

9.4.4. Operating states

Status of LEDs		DLT-V83 Status
Supply voltage (green) 	Temperature (red) 	
OFF	OFF	Initial state, idle time – waiting for a new ignition signal or for the <Power> key after switch off; no voltage supply.
OFF	FLASHING	Temperature sensor malfunctioning.
FLASHING	OFF	DLT-V83 is in standby mode (S3).
OFF	ON	Computer will only start if the temperature in the device is in the range between -30 and +62 °C again.
ON	OFF	Computer start-up/normal operational state/shutdown delay time.
ON	ON	Temperature < -30 or > +70 °C.
ON	FLASHING	Temperature sensor malfunctioning.

9.5. DLT-V83 front keys with PCT touchscreen

9.5.1. Overview of the operating elements on the front side




Fig. 9.3: Example: Operating elements front side DLT-V8310 with PCT touchscreen



9.5.2. Function of the front keys

The keys are backlit in blue when the device is switched on.
When the key is pressed, the lighting switches briefly to white.

Keys and LED, left on the device:

Key	Explanation
	<Power> button, switch device on/off: To do this, press and hold the button for 2 seconds After the device has been switched off, it can only be switched on again after 10 seconds.
	Manual brightness control: Display brighter
	Manual brightness control: Display darker




Switch the backlight on/off



NOTE: The DLT-V83 will continue to react to keyboard, mouse and touchscreen inputs even if the backlight is switched off.

The key glows white when the backlight is switched off




The backlight can also be switched on using the "Display brighter" key.

LED	Explanation
	Access to storage medium (backlit green when active).

Key on the right of the device:

Key	Explanation
	Special keys <S1> to <S8> These keys are configured with the "DLoG Config" program; the associated manual is available on our websites.
	Shift key <Shift> is activated when the key lights up white. This allows access to the functions <S5> to <S8>.

9.5.3. Operating states

<Power> key	Color	Explanation
	White	When the <Power> button is pressed briefly, it lights up white. To start the device, the key must be held pressed for at least <u>2 seconds</u> .
	Blue	Once the device boots, all keys light up blue until the device is switched off again.
	Red	Indicates a temperature in the device that is below or above the normal range. Computer will only start if the temperature in the device is in the range between -30 and +62 °C again.

9.6. Software keyboard (optional)

The optional A-DLoG software keyboard brings the complete standard keyboard with function keys and numeric pad directly to your DLT-V83 screen – with easy touch operation.

Any entries made, for example, letters and numbers, are passed to the currently active application program.

Example for a software keyboard (the layout can be configured individually):



Fig. 9.4: Software keyboard example

If the software keyboard was ordered together with the DLT-V83 Industrial Computer, then the program will have been fully pre-licensed by the Advantech production department. For subsequent installation, an installation program is available.



The manual for the DLoG software keyboard is available on our websites.

10. General device configuration



WARNING

Risk of injury and Property damage due to improper configuration.

These instructions are directed to skilled personnel.

Only skilled personnel (e.g. IT personnel with good knowledge of PCs, operating systems and radio networks) may configure the DLT-V83.

If the DLT-V83 is incorrectly configured, any warranty for this device will be void.

10.1. Operating systems (optional)



Please find the latest overview of all supported operating systems in the DLT-V83 data sheets on our websites.

Operating systems (in Feb 2019):

- Windows 10 IoT Enterprise
- WE8S
- WE 8.1 Industry Pro
- WES 7
- Win7 Pro
- Linux

10.2. Image compatibility of varying CPUs

Identical operating system images can be used for DLT-V83 devices with Intel® Core™ i5 CPU and for devices with Intel® Celeron® CPU, the operating system images are compatible with both CPUs.

DLT-V83 devices with Intel® Atom™ CPU work with their own operating system images.

You can check to BIOS setup of the device to determine the type of processor.

10.3. Linux OS (optional)

The configuration of the DLT-V83 with Linux with regard to radio networks, touchscreen calibration, etc. is described in the “Advantech Linux Manual”.



Please contact our Technical Customer Support if required.

10.4. MS-Windows OS (optional)

10.4.1. Setting up MS-Windows

Pre-installed on flash

If a DLT-V83 with preinstalled operating system is placed into operation, this operating system will be loaded after the BIOS system messages. System-specific device drivers (e.g. for graphics, sound, network, touchscreen) are already installed.

In DLT-V83 units with a pre-installed operating system, the system is located on the C partition.

Installing on flash

When a DLT-V83 is started up for the first time without a pre-installed operating system, the user needs to carry out a number of steps that will vary depending on the system to be installed. Refer to the relevant operating system manual for specific instructions.


10.4.2. USB recovery stick

The optional Advantech recovery stick allows images to be backed up and restored onto the DLT-V83 when necessary (backup & recovery).

Please contact your Advantech sales representative if needed.

10.4.3. WES 7 and Win 7 Prof.: USB icon in the taskbar

Under WES 7 and Win 7 Professional, please observe:

⇒ Do not click on the **Eject DLT-V83xx** button, which fades in on the taskbar using the **Eject Media** icon: 

If the **Eject DLT-V83xx** button is clicked on:

- Malfunctions during the communication with the environment controller are possible.
- The operating system must be restarted.

10.5. Configuring the front keys, automatic shutdown, etc.

Use the “DLoG Config Tool” for settings like the following:

- Configure the front keys of the DLT-V83.
- Configure the WLAN status display.
- Define the switching on and off of the DLT-V83 in conjunction with the vehicle ignition (automatic shutdown).

For configuring DLT-V83, the DLoG Config version 4.0.3 (or higher) is required.



The DLoG Config manual is available on our websites.

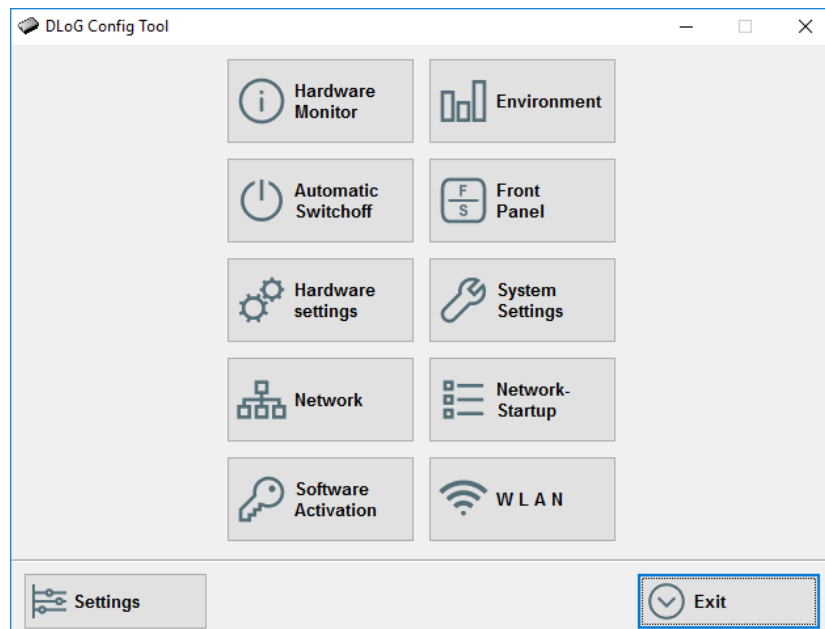


Fig. 10.1: DLoG Config Tool main menu, example Win 10 IoT Enterprise

10.6. Automatic shutdown

The **DLoG Config** program is used for the configuration of the automatic shut down under MS-Windows.



The DLoG Config manual is available on our websites.

The configuration under Linux is explained in the “Advantech Linux Manual”.



Please contact our Technical Customer Support if required.

10.6.1. Functional description

The DLT-V83 is equipped with an automatic shutdown module.

If wired up accordingly, the DLT-V83 conveniently switches off together with the vehicle’s ignition (NOTICE: Ignition signal with DC devices only). As disconnecting the power supply during operation can lead to data loss, the operating system needs to be shut down normally using the appropriate hardware and software installed on the system when the ignition is switched off.

The DLT-V83 is connected to the vehicle with three supply cables.

DC+ and DC- are directly connected to the power supply of the vehicle, the connection is of course run through fuses. The supply voltage connected is then linked to the DLT-V83’s ignition input via a switch, for example, the key switch of the ignition (also with a fuse).

10.6.2. Sequence

When the vehicle ignition is turned on or the DLT-V83 <Power> button is pressed, the DLT-V83 checks its internal temperature and runs a test to confirm that the automatic shutdown function is working.

If this check of the environmental conditions is successful, the DLT-V83 starts the operating system normally.

Once these checks have been successfully completed, the DLT-V83 starts the operating system. No environmental conditions (e.g. the internal temperature of the device or the state of the ignition input) are checked for three minutes during startup.

After three minutes, the DLT-V83’s internal temperature and the state of the ignition input are constantly monitored.

If the DLT-V83’s internal temperature reaches a critical level, a controlled shutdown of the operating system is carried out. The computer will remain switched off until the temperature is once again within the permitted range.

If the ignition input is grounded or isolated during normal operation of the DLT-V83, the device will switch to a delayed shut-off state.

The device will continue to operate normally in this state until the shut-off delay (e.g. 15 minutes) has elapsed.

If the ignition is turned on again during this shut-off delay, the DLT-V83 will revert to a normal operational state.

Once the shut-off delay (after run time) has elapsed, the operating system will shut down and the device will automatically shut down (e.g. after three minutes or a signal from the operating system).

Device shut down

If the operating system is shut down, all applications will be notified via the Windows message "WM_QUERYENDSESSION" first.

Every application must then respond within the time set in the registry. If there is no response within the preset time, the application will be hard-terminated.

It may not be possible to close an application automatically if it has unsaved data. Example: For example, the WORDPAD.EXE program (included in Windows) cannot be closed automatically if there are unsaved changes. In such a situation, WORDPAD.EXE will acknowledge the "WM_QUERYENDSESSION" Windows message by prompting the user to choose whether to save or not.

All applications that can be terminated without user confirmation using the keyboard shortcut <ALT> + <F4> will normally also respond correctly to the "WM_QUERYENDSESSION" message and therefore do not need to be hard-terminated.

To ensure that important data is saved correctly, the application must respond appropriately to "WM_QUERYENDSESSION", i.e. the backup data must be saved without user confirmation and within the preset time.

10.7. CAN and digital I/O settings (optional)

To configure and test the CAN and digital I/O settings, the "IXXAT" driver is used.

It is available at www.advantech-service-iot.eu

Downloads -> Service -> Drivers -> Advantech-DLoG Products -> Additional-Drivers-Software



Fig. 10.2: Start of the IXXAT driver installation

When installing the "IXXAT", configuration and test tools are copied to the DLT-V83.

10.7.1. iManager

The "iManager" offers embedded firmware that can be used to manage and test the onboard devices simply and independently from the operating system. This improves system stability and compatibility. The "iManager" offers a collection of standardized APIs for hardware monitoring, GPIO selection/analysis, Multi-Level-Watchdog and more.

In the area **GPIO Bank Control**, outputs DO1 to DO3 can be set and inputs DI1 and DI2 can be queried:

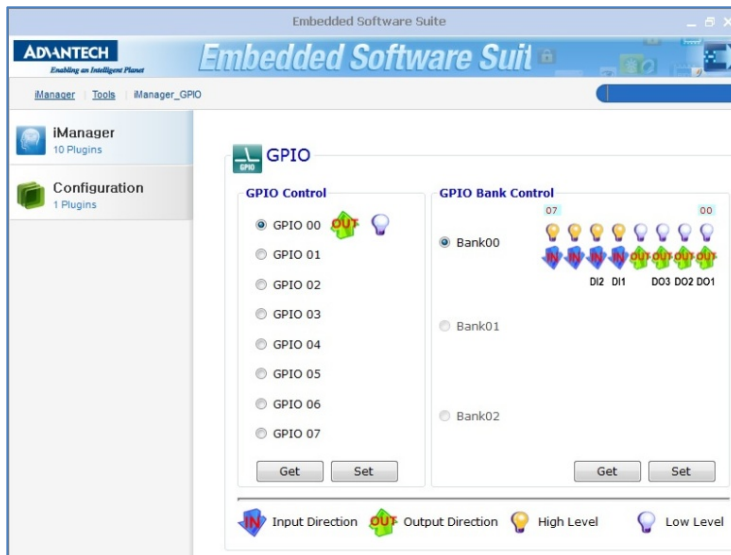


Fig. 10.3: iManager: GPIO Bank Control

Information about the "iManager" is available in the Internet at <http://www.advantech.de/embcore/imanager.aspx>.

Hardware details such as the pin assignment of the CAN and Digital I/O interfaces are described in the following chapter:

7.3.4 CAN, digital I/O and second Ethernet interface (optional)

10.8. Protecting the display from the memory effect

The display of the DLT-V83 has to be protected from the burning in of a motionless image. An image that has remained motionless for too long can cause irreversible damage to the display.

In the **power management center** of the utilized operating system, you must specify that the display of the DLT-V83 should be turned off when no user input occurs.

A motionless image can stay on the display for a maximum of 12 hours. After more than 12 hours there is the risk of the memory effect.

10.9. (Re)calibrating the touchscreen

The touchscreens of all DLT-V83 devices are already calibrated and therefore do not have to be calibrated when first put into operation.

Software recalibration under Windows 7 Pro, Windows 8.1 Industry and WE8S

These Microsoft Windows versions offer the option of software recalibration for the touchscreen (**Control Panel -> Tablet PC Settings**).

This resets the sensitivity of the touchscreen to an operating system default setting, which can result in poorer detection of taps on the screen.

You can use **Reset** to reset the software recalibration.

10.10. ErP settings for AC devices

The DLT-V83 with AC power supply unit fulfills the EU regulation number 617/2013 on the implementation of the eco-design/ErP directive 2009/125/EG. This regulates the maximum standby energy consumption.

To achieve the maximum power savings, certain settings must be made to the BIOS and in the Windows network configuration.

This power savings is first achieved if the DLT-V83 has run through the BIOS one time and been shut down in a controlled way.

10.10.1. BIOS settings in order to deactivate WakeOnLAN

Menu	Setting
Advanced -> Chipset -> South Bridge Chipset Configuration -> GbE Wake Up From S5	GbE LAN Wake Up From S5: [Disabled]
Advanced -> Hardware Health Configuration -> Power Saving	Power Saving: [Enabled]

If **WakeOnLAN** is deactivated, the DLT-V8315 cannot be started from standby mode via Ethernet (remote).

10.10.2. MS-Windows settings for deactivating WakeOnLAN

In the **network properties (Network Connection Properties)** of the DLT-V8315:

⇒ Configure Power Management and LAN Connection so that **WakeOnLAN** is deactivated.

Example: Deactivate WakeOnLAN under WES 7:

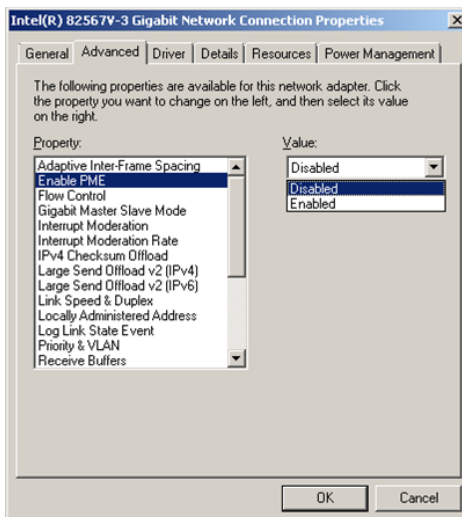


Fig. 10.4: Network Connection Properties, Advanced

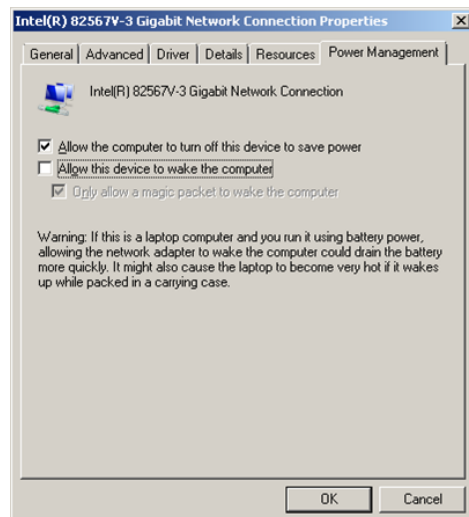


Figure 10.5: iManager: Network Connection Properties, Power Management

Settings for activating WakeOnLAN

Example: Activate WakeOnLAN under WES 7:

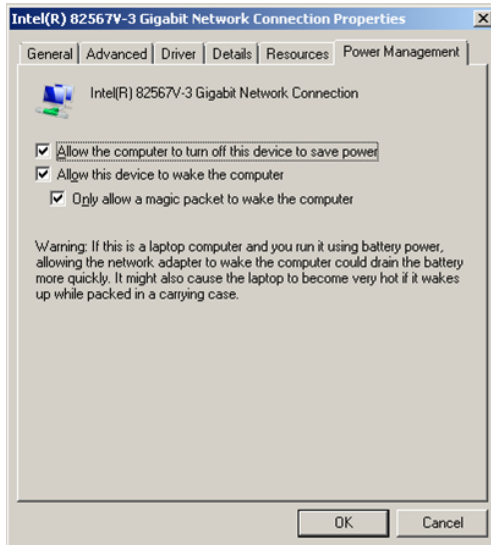


Fig. 10.6: Network Connection Properties, Advanced

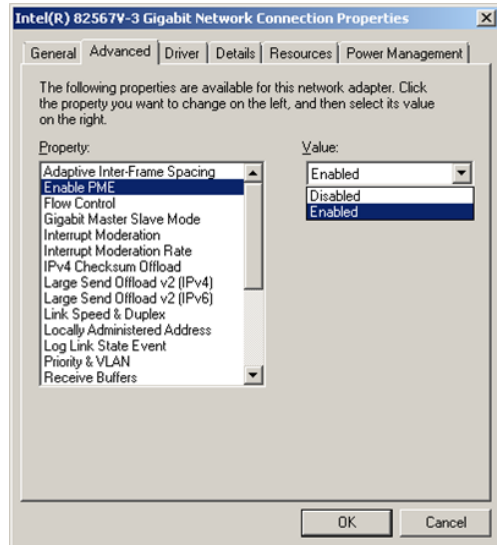


Figure 10.7: iManager: Network Connection Properties, Power Management

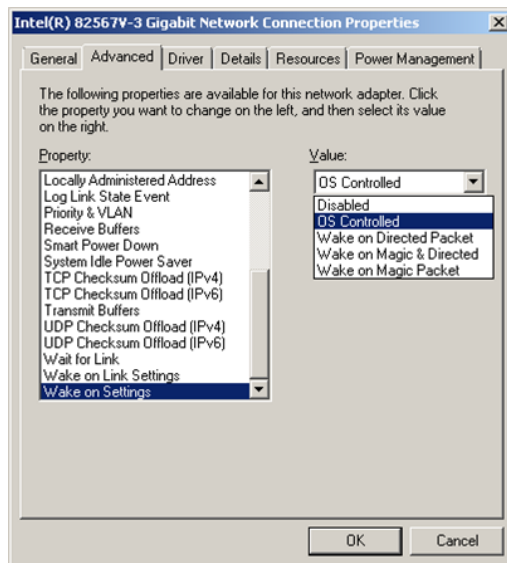


Fig. 10.8: Network Connection Properties, Advanced

10.10.3. Power options

To optimize the power consumption of the DLT-V83, adapt the power options accordingly. Relevant settings:

- Time until the DLT-V83 automatically switches to power-saving mode.
- Time until the screen switches off automatically.

11. WLAN configuration

11.1. Safety notice



CAUTION

Danger of radiation emission.

DLT-V83 devices with radio technology emit high frequency energy (abbreviation: HF). To protect persons against HF radiation:

- ⇒ Mount the DLT-V83 so that persons and domestic animals maintain a minimum distance of 20 to 50 cm from the radio antennas.
- ⇒ Ensure that persons observe this minimum distance when operating the DLT-V83.
- ⇒ High frequency energy can interfere with technical devices. For this reason, do not use the DLT-V83 in the vicinity of pacemakers or other medical devices.
- ⇒ Only operate the DLT-V83 with radio modules that are approved by the manufacturer for this device.
- ⇒ Make sure that the transmission power and the radio frequency of the DLT-V83 comply with the regulations for the respective country where the device is deployed.
- ⇒ Observe all applicable regulations for your deployment location/country with regard to operating channels, radio frequencies and the maximum permissible transmitting power. Responsibility for this lies with the company operating the DLT-V83. The regulatory authorities in the relevant country can provide information on this.

Any modifications to the DLT-V83 which are not expressly approved by the party responsible for the compliance can lead to the withdrawal of the operating license for this device.

Examples of country-specific regulations:

<u>Region:</u>	<u>Radio approval:</u>
EU	RED (formerly R&TTE)
China	SRRC
Japan	MIC (formerly TELEC)
Taiwan	NCC
Canada	Canada IC
USA	FCC

Antenna solutions for use in Germany

The Advantech antenna solutions are based on the prevailing IEEE 802.11 standard. This standard allows radio data transfer at rates from 1 Mbps to 54 Mbps (300 Mbps if using IEEE 802.11n) using the 2.4 GHz and 5 GHz frequency band.

Information on radio performance

The consistency of the radio performance is dependent on the following factors:

- Radio card (set transmission power)
- Connecting cables
- Antenna gain

Help table for the correct setting:

Translation between mW and dBm																							
dBm	-1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
mW	1	2	3	4	5	6	8	10	12	15	20	25	30	40	50	60	80	100	125	150	200	250	

11.2. Differences between MS Windows and Linux

The radio configuration of the DLT-V83 with MS Windows operating system is described in the following manual sections.

The radio configuration of the DLT-V83 with Linux is described in the “Advantech Linux Manual”.



Please contact our Technical Customer Support if required.

11.3. Preparation work at the factory

The following preparations have already been carried out at the factory for the optional radio functionality of the DLT-V83:

- The radio card and the corresponding drivers are installed.
- A default profile with basic settings is defined.

NOTICE: Property damage**No access to radio cards in the DLT-V83**

Radio cards are located inside the devices and are not accessible from the outside.

Only the manufacturer and its authorized service centers may open the device and install/remove radio cards.

11.4. Customer-specific settings

To create a customer-specific profile:

- ⇒ Use the configuration program that is already factory-installed on the DLT-V83.
- ⇒ Observe the description of the configuration programs in the following sections.

Radio card		Operating system	Configuration program
SUMMIT/LAIRD SDC-PE15N		Windows	Laird Connection Manager (LCM) Password: SUMMIT (upper case mandatory)
			Wireless Zero Configuration (abbreviation: WZC) No password required
SPARKLAN WPEQ 261 ACN (BT)	Qualcomm Atheros QCA61x4A Wireless Network Adapter	Windows	Advantech WLAN Client Manager (IGX Tool) Password: gold
			Wireless Zero Configuration (abbreviation: WZC) No password required
		Linux	Linux Configuration Utility

11.5. Windows Zero Configuration (WZC)

WZC (Windows Zero Configuration) is a tool for automatic WLAN configuration in MS Windows.



Comprehensive information can be found in the online help for the program.

11.6. Advantech WLAN Client Manager (IGX Tool)

11.6.1. Area of application

This chapter describes the **Advantech WLAN Client Manager** program version 1.00 under the following operating systems:

- Win7Pro
- WinEmbStd7
- Win8.1IndPro
- Win10IoTent

This chapter applies to DLT-V83 devices with the Radio card "SPARKLAN WPEQ-261ACN(BT) MiniPCIe".

11.6.2. After image reinstallation: Driver installation

If the image has been reinstalled, the DLT-V83 must be set up again using the IGX WLAN driver.

Two drivers are available:

- Driver for Win7Pro \ WinEmbStd7
- Driver for Win8.1IndPro \ Win10IoTent

11.6.3. Requirements

The currently available IGX drivers can be downloaded from the following website:

www.advantech-service-iot.eu -> Downloads -> Service -> Drivers -> Link to FTP:
Advantech-DLoG_Products\Additional-Drivers-Software\WLAN_driver\X86_(DLoG_MPC_MTC_IPC_series\Sparklan_261_ACN_BT

Once the download has completed, the contents of the ".zip" directory on the desktop must be unzipped.

NOTE

The following steps should be performed as the **Administrator** for the installation process.

11.6.4. Driver installation WinEmbStd7

If it is not known which operating system variant (32 or 64 bit) is installed on the DLT-V83, the system overview can be used for testing:

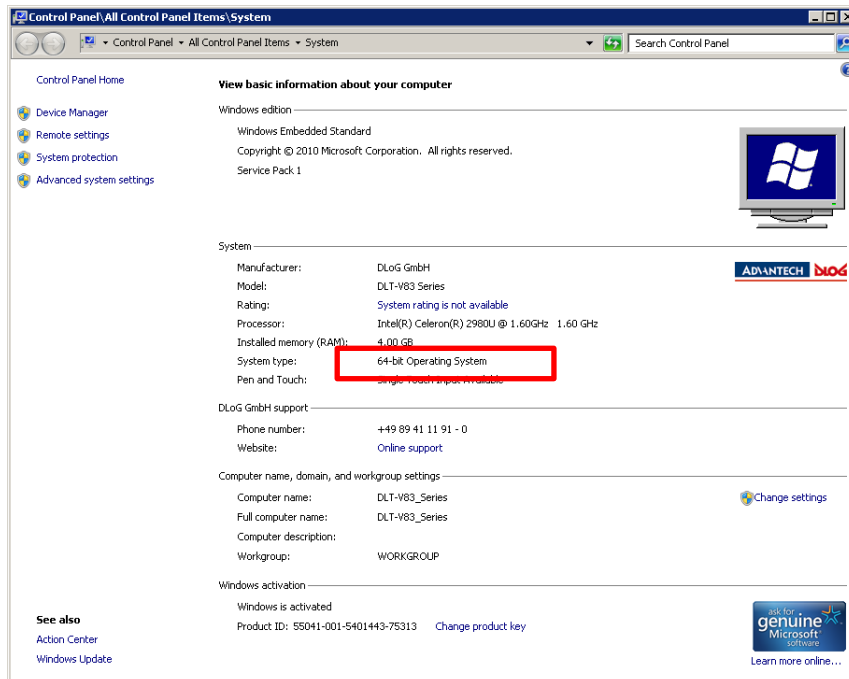


Figure 11.1: System overview in Control Panel

For 32 bit systems:

- ⇒ Open the subfolder **Win7_X86**.
- ⇒ Run **Setup.exe** to start the installation.

For 64 bit systems:

- ⇒ Open the subfolder **Win7_X64**.
- ⇒ Run **Setup.exe** to start the installation.

NOTE

Setup.exe in the main folder is not supported in WinEmbStd7.

Example screenshot for 64 bit system, subfolder **Win7_X64**:

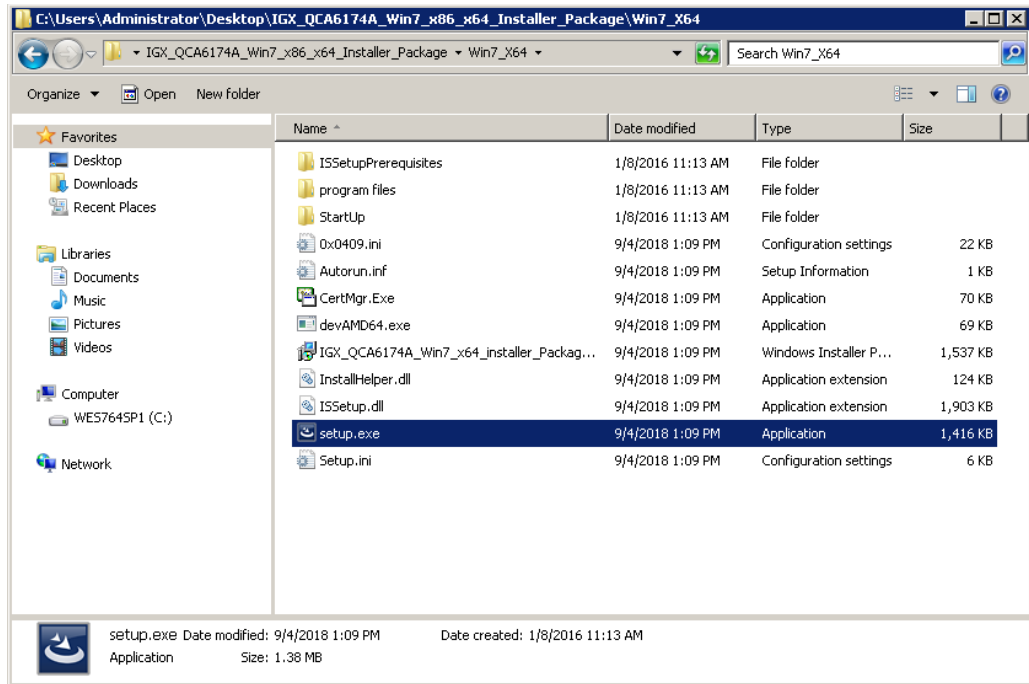


Figure 11.2: Setup.exe for 64 bit operating system in the subfolder Win7_X64

NOTE

The remaining installation workflow is covered in the next chapter and is identical in all operating systems.

11.6.5. Driver installation Win7Pro / Win 8.1 IndPro / Win 10 IoT

- ⇒ Open the corresponding installation directory depending on the operating system.
- ⇒ Run **Setup.exe** to start the installation.

NOTE

The following installation example shows the Win8.1 / 10 driver.

For Windows7 installation, please use the corresponding Win7 driver.

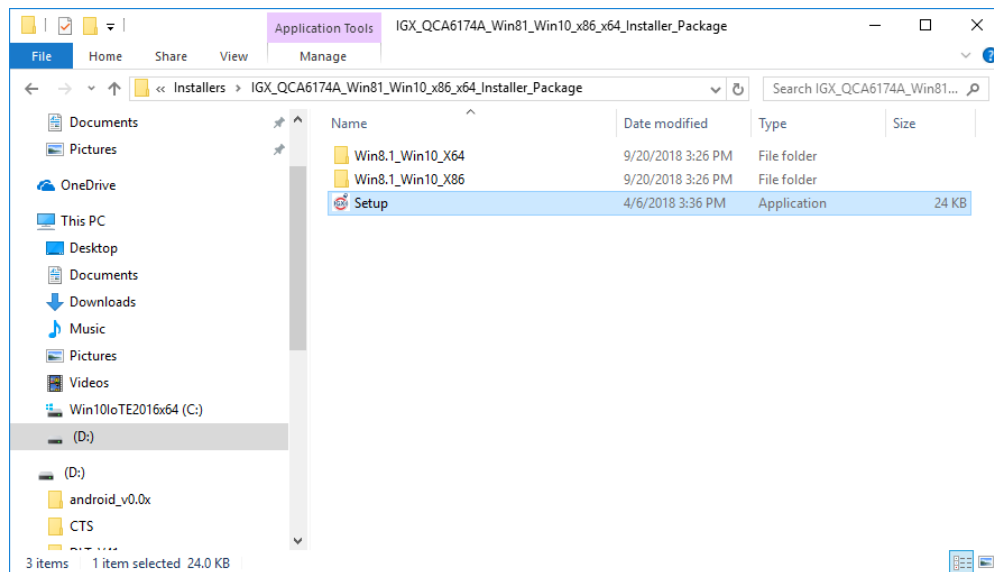


Figure 11.3: Setup.exe for 64 bit operating systems Win8.1 / 10

If the C++ executables / runtimes required for the installation are missing on the operating system, these must be set up before running the WLAN driver installation.

Respond to the relevant prompt in the installation workflow.

On completion, the following window is displayed that starts the actual driver installation process:

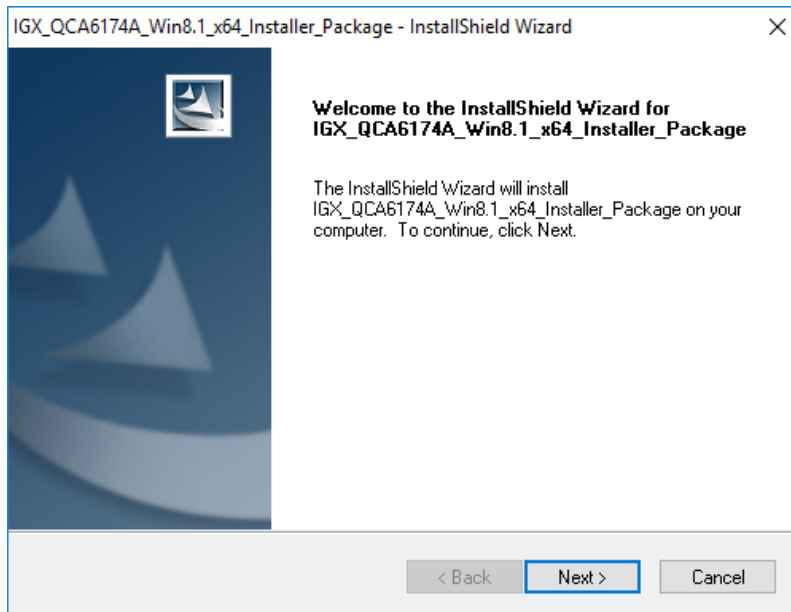


Figure 11.4: IGX driver installation Welcome dialog

⇒ Continue the installation with **Next**:

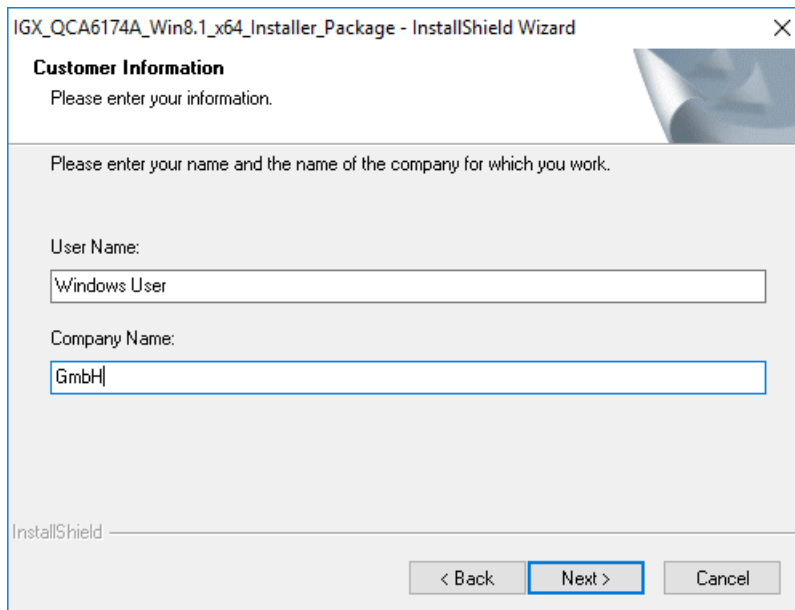


Figure 11.5: IGX driver installation user and company name

⇒ In this dialog, enter a **username** and a **company name** and confirm with **Next**.

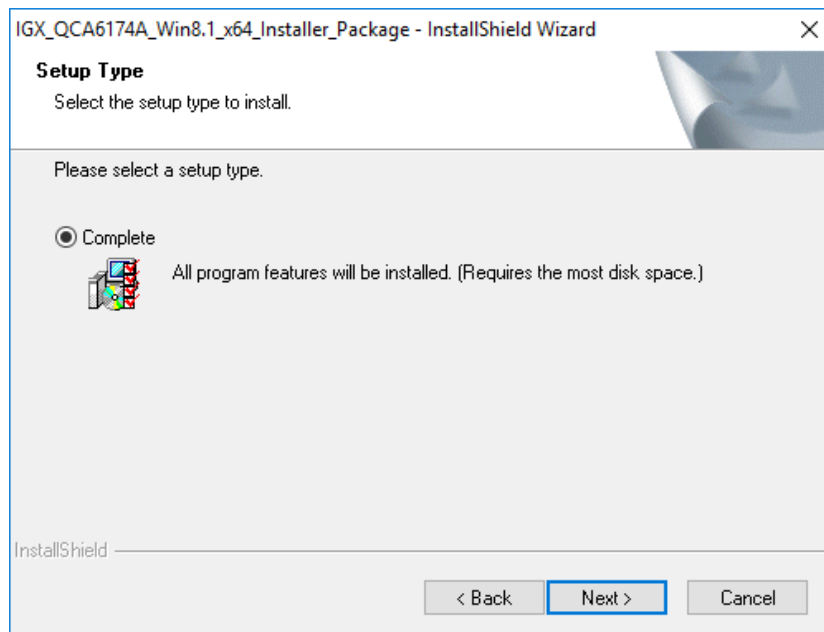


Figure 11.6: IGX driver installation All program features

- ⇒ Leave the **Complete** option enabled.
- ⇒ Continue the installation with **Next**.

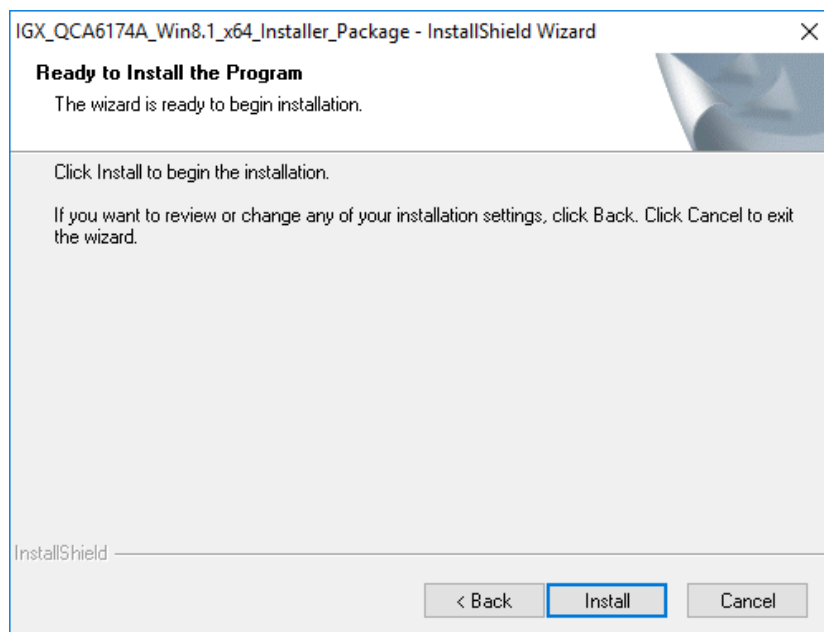


Figure 11.7: IGX driver installation starts

- ⇒ Continue the installation of the required files with **Install**.

During installation, the following window is opened:

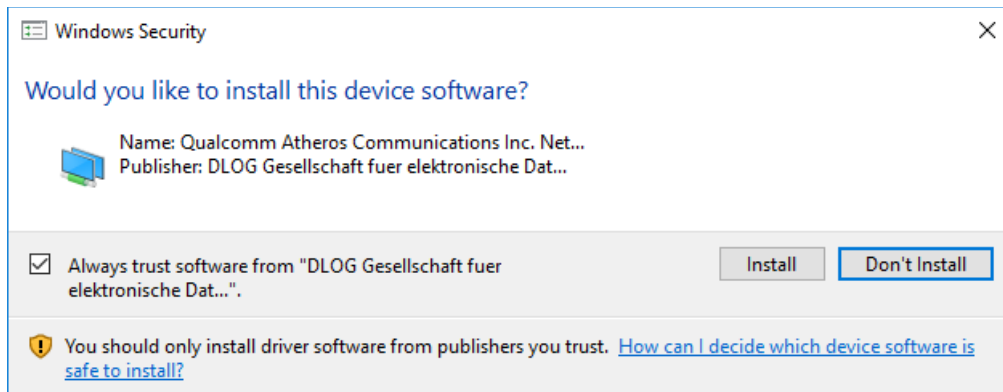


Figure 11.8: IGX driver installation Windows Security

- ⇒ Ensure that the **Always trust software from...** option has been selected.
- ⇒ Continue the driver installation with **Install**.

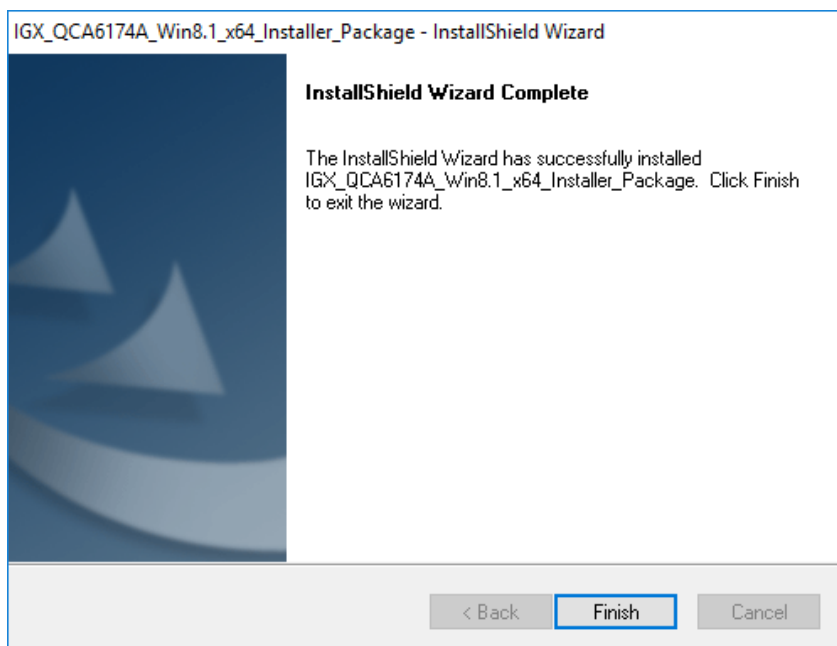


Figure 11.9: IGX driver installation Exit with Finish

- ⇒ Exit the driver installation with **Finish**.

NOTE

It is recommended to run the required system re-start directly following installation.

- ⇒ Select **Yes, I want to restart my computer now**.
- ⇒ Press the **Finish** button.

The system re-start is carried out.

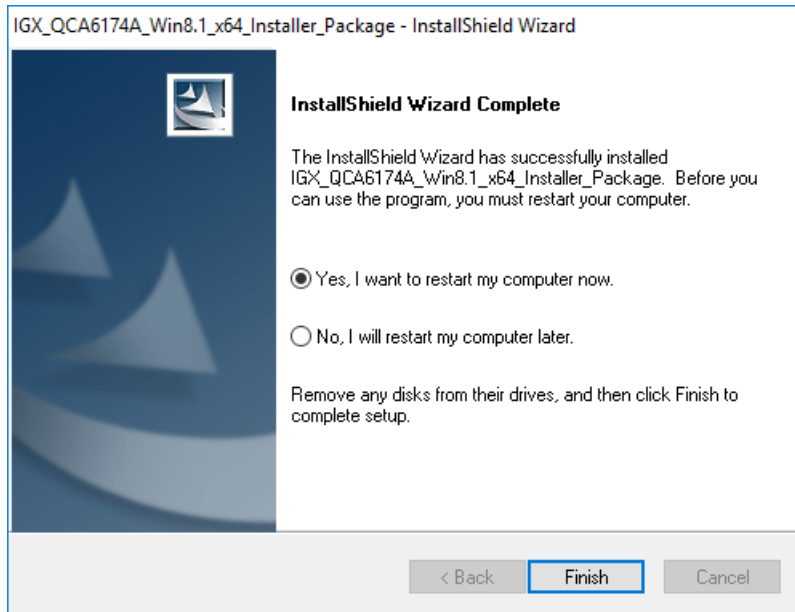


Figure 11.10: IGX driver installation Perform computer re-start

11.6.6. Start WLAN Client Manager, Login

⇒ Launch the WLAN Client Manager by double-clicking the **Launch WCU** icon:

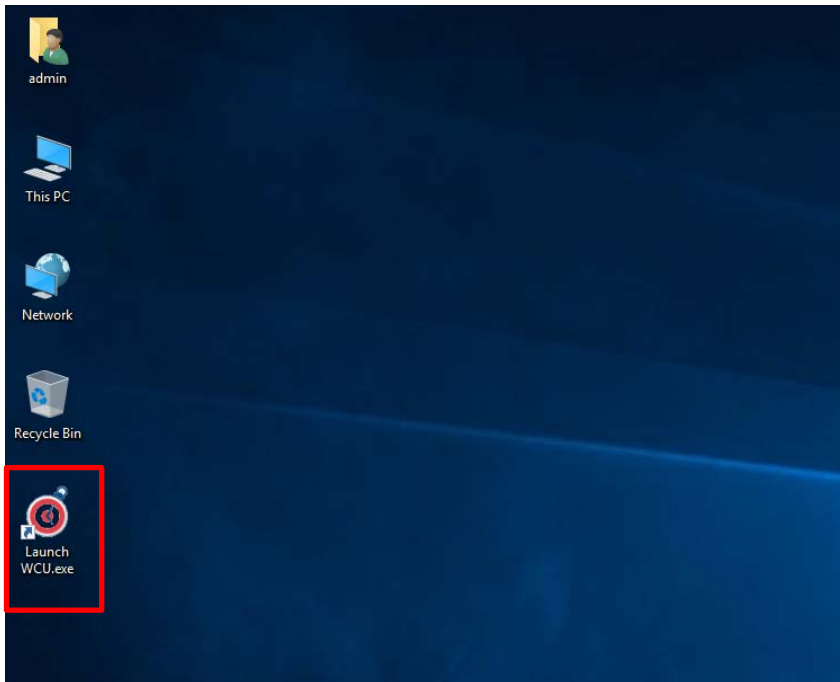


Figure 11.11: WCU icon on the desktop

You must login as "WCU_Administrator" first.

⇒ To do this, click **Admin Login**.

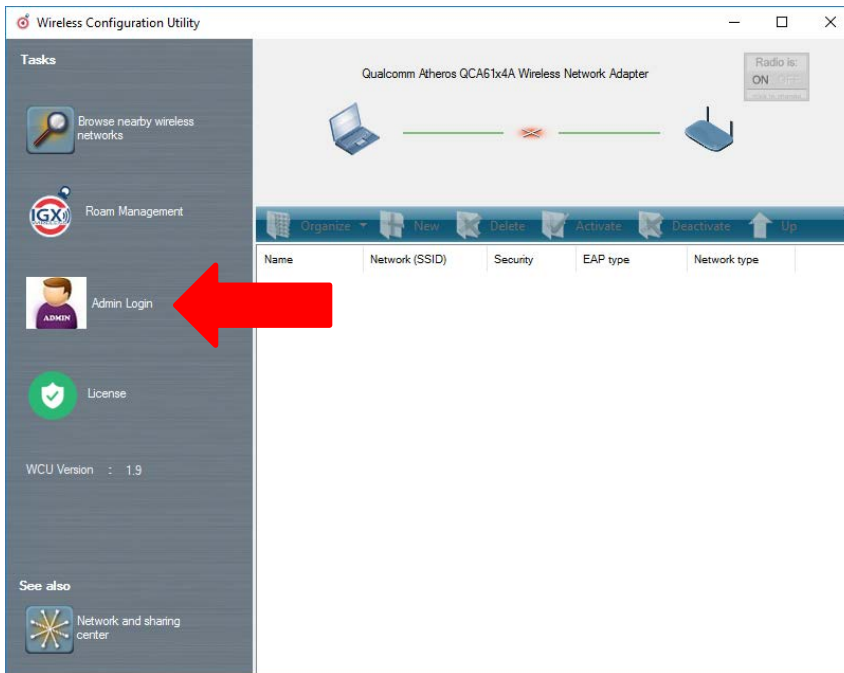


Figure 11.12: WCU main window, Admin Login

- ⇒ Then open the login window.
- ⇒ Enter the passport, which by default is **"gold"**.
- ⇒ Confirm the input with the **Login** button.

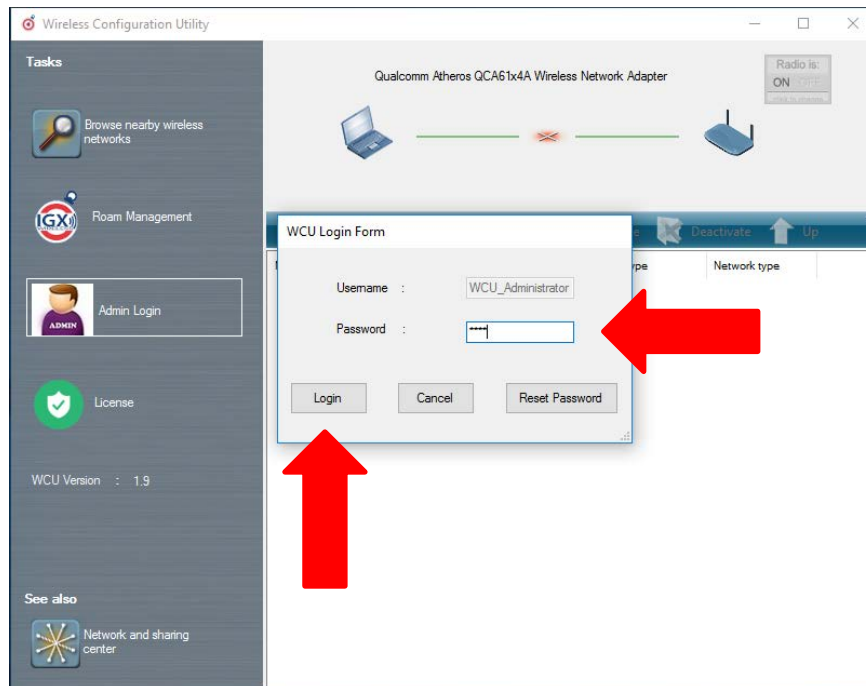


Figure 11.13: WCU-Administrator login window

11.6.7. WLAN Client Manager functions

11.6.8. License

The **License** function lists the current status of the enabled options:

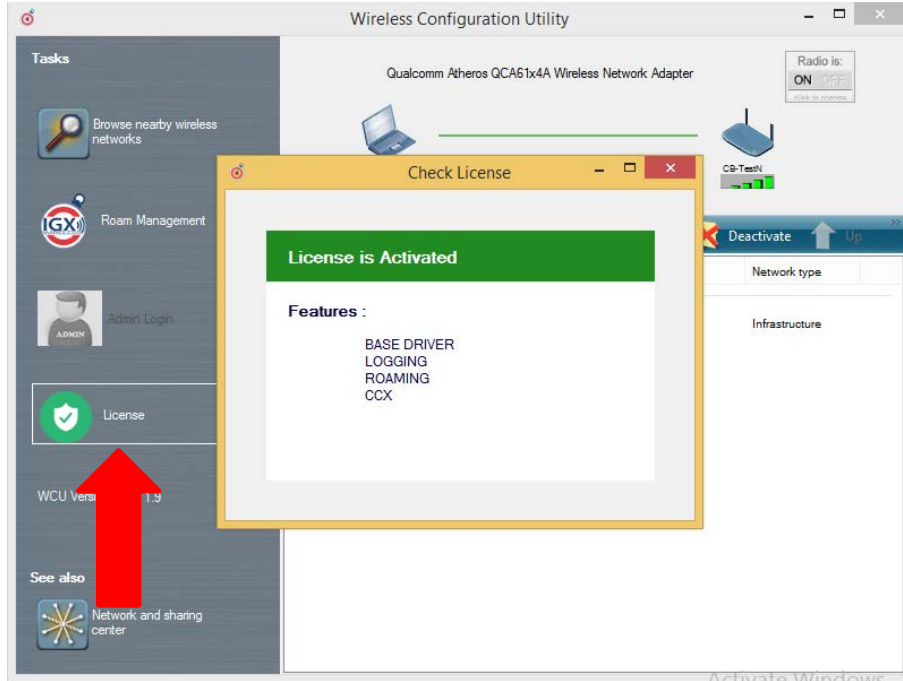


Figure 11.14: Check License

NOTE

The correct implementation of the WLAN driver requires a valid license in combination with the DLT-V83 terminal.

If, as shown in the image, the license information is missing:

⇒ Contact technical customer support to solve the problem.

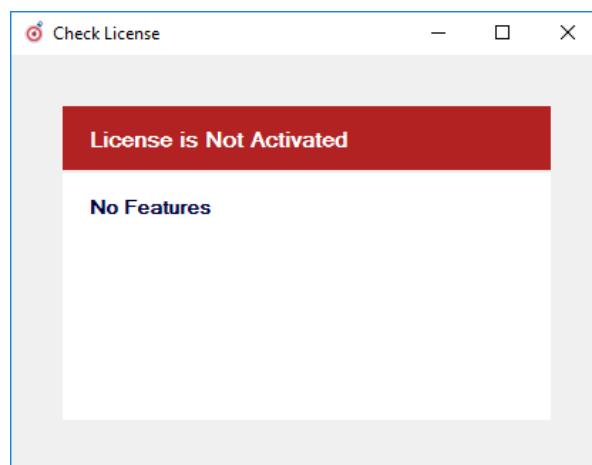


Figure 11.15: Info display via existing license

11.6.9. Browse nearby wireless networks

11.6.9.1. Set up the WLAN connection

To set up a WLAN connection, you can show all available networks using the **Browse nearby wireless networks** function.

You can select the appropriate network from here.

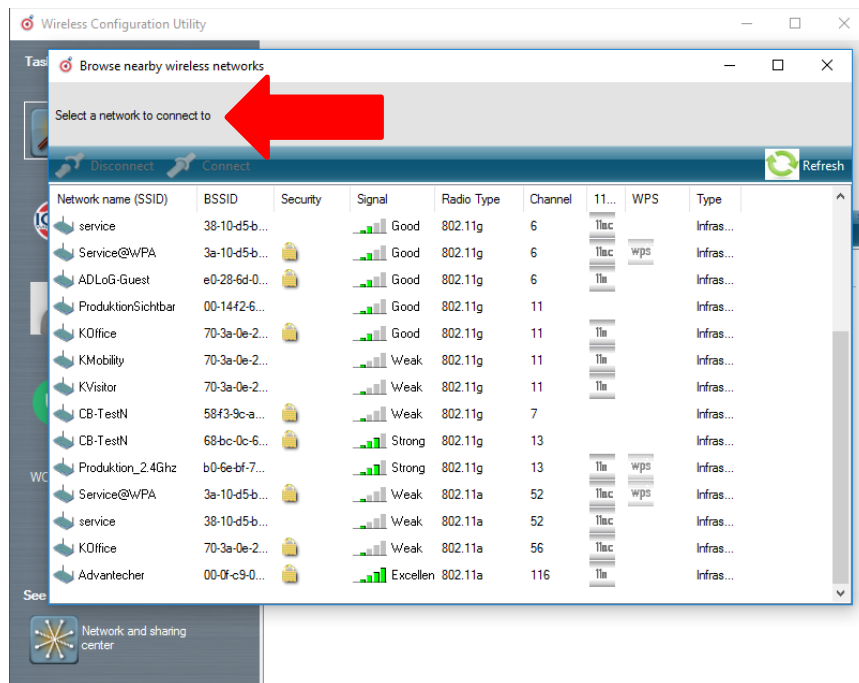


Figure 11.16: Browse nearby wireless networks function

11.6.9.2. Define security settings

The security settings must now be selected depending on the network.

These settings can be made in the **Advanced Security Settings** section:

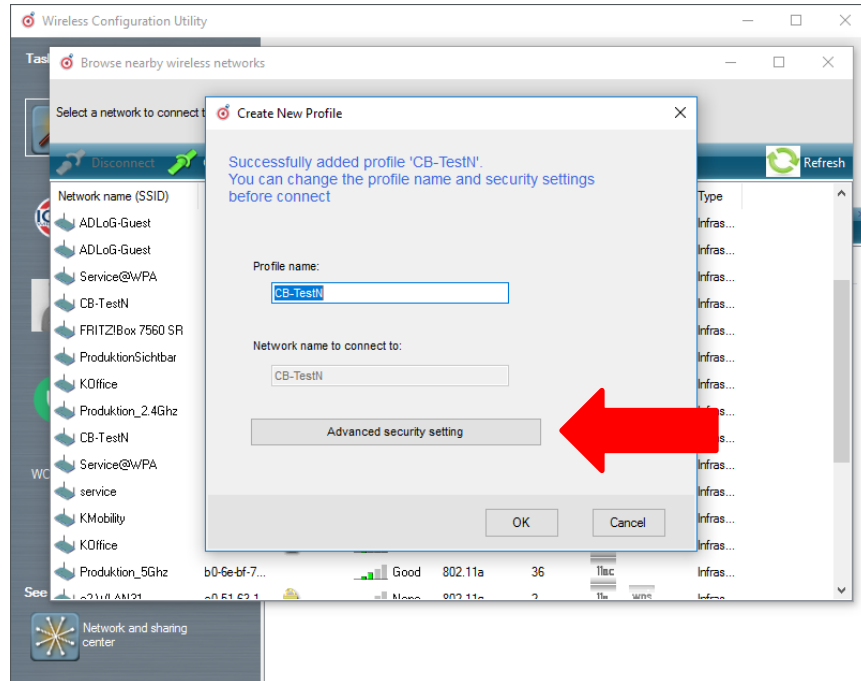


Figure 11.17: Advanced Security Settings dialog

To be able to connect with the network automatically, set the checkmark to **connect automatically when the network is in range**:

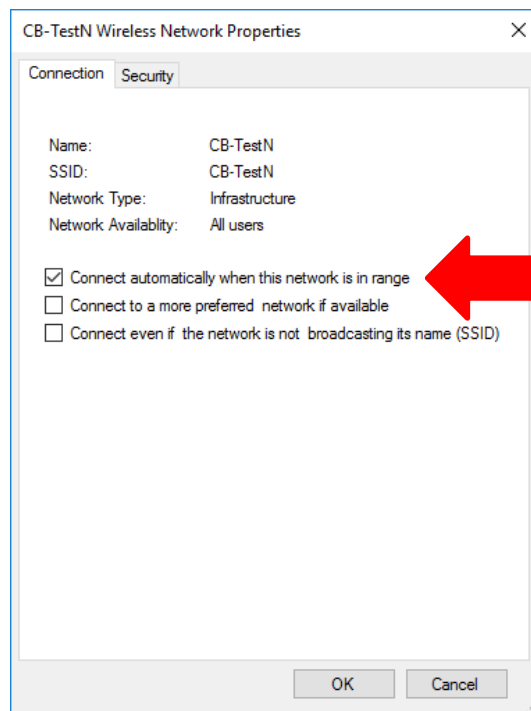


Figure 11.18: Connection when the network is in range dialog

Available parameters in the **Connection** and **Security** sections:

Connection

Connect automatically when the network is in range	Enable this parameter to set up an automatic connection to the network.
Connect to a more preferred network if available	In the event of multiple profiles being present, this option can be used to select the preferred profile.
Connect even if the network is not broadcasting its name (ssid)	This option can be used to set that a connection is still established when the name of the network is not being transmitted.

The **security settings** (*Figure 11.17: Advanced Security Settings dialog*) must be adapted. These settings differ depending on the network.

The **Security Type** must be selected first.

The following options are available:

- No authentication (Open)
- WPA2-Personal
- WPA2-Enterprise
- CCKM

The encryption process (**Encryption Type**) is then selected.

The options available here depend on the selected **Security Type**.

- None
- WEP
- AES

This results in the following selection options and settings:

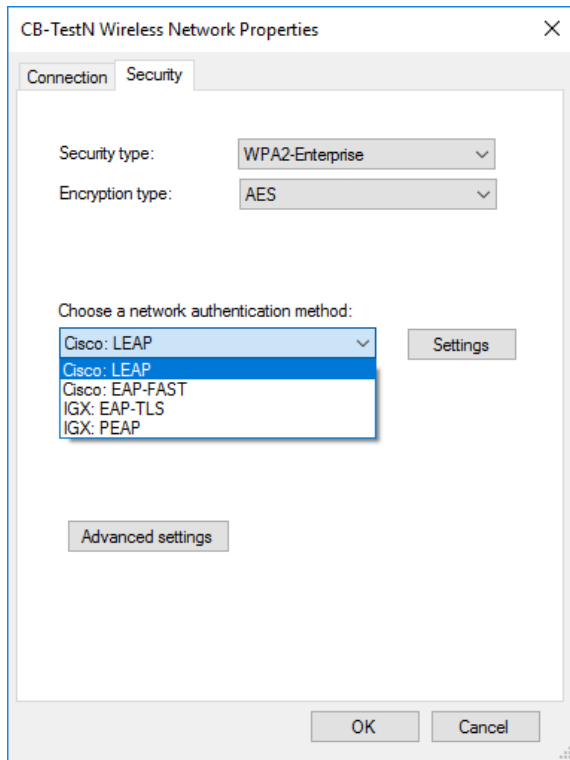


Figure 11.19: Security settings - network authentication methods

The **network authentication methods** shown, as well as their designations, differ depending on the operating system used.

For the remaining settings as in the case shown above (**Cisco: Leap**), the required additional parameters are carried out using the two buttons **Settings** and **Advanced settings**.

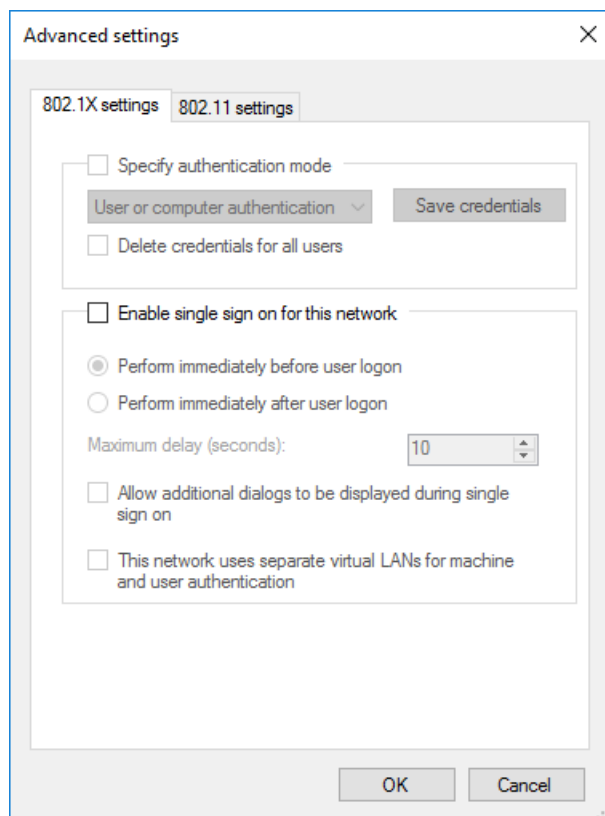


Figure 11.20: Security settings – Advanced settings (Cisco: Leap)

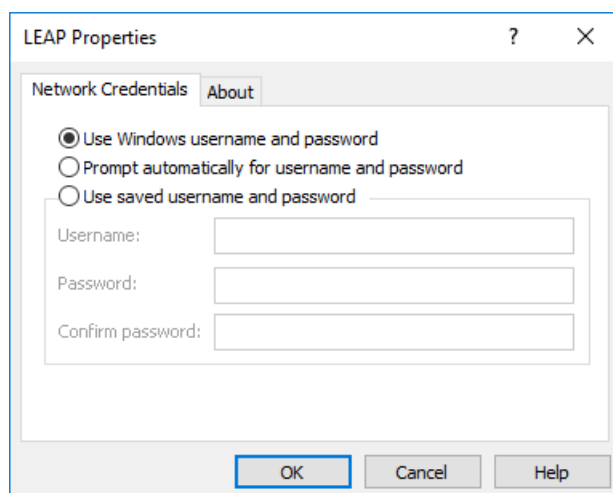


Figure 11.21: Security settings – LEAP properties

- ⇒ Lastly, the network key must be entered in the following example (**WPA2-Personal**) (**Network Security Key**).
- ⇒ Confirm the settings with **OK**.

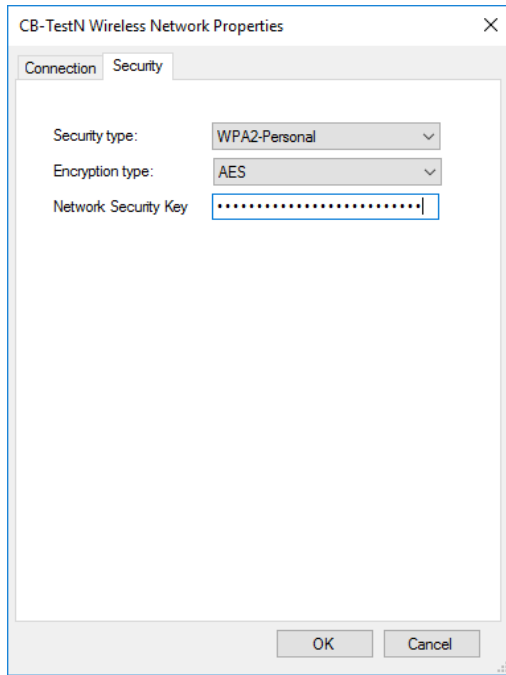


Figure 11.22: Wireless Network properties dialog

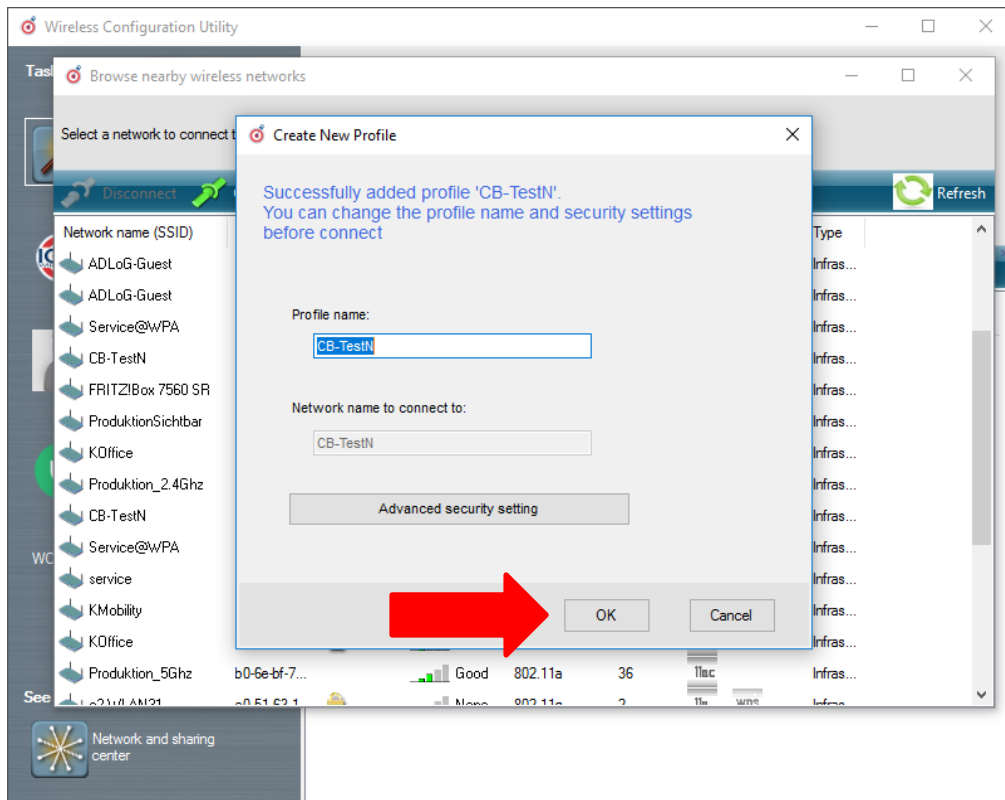


Figure 11.23: Create new profile dialog

⇒ Confirm the new profile with the **OK** button.

11.6.9.3. Establish network connection

After the WLAN profile settings have been made, a connection to the network is established automatically.

The connection setup with the selected network is successful only if the "green" connection line is displayed in the **WCU** main window.

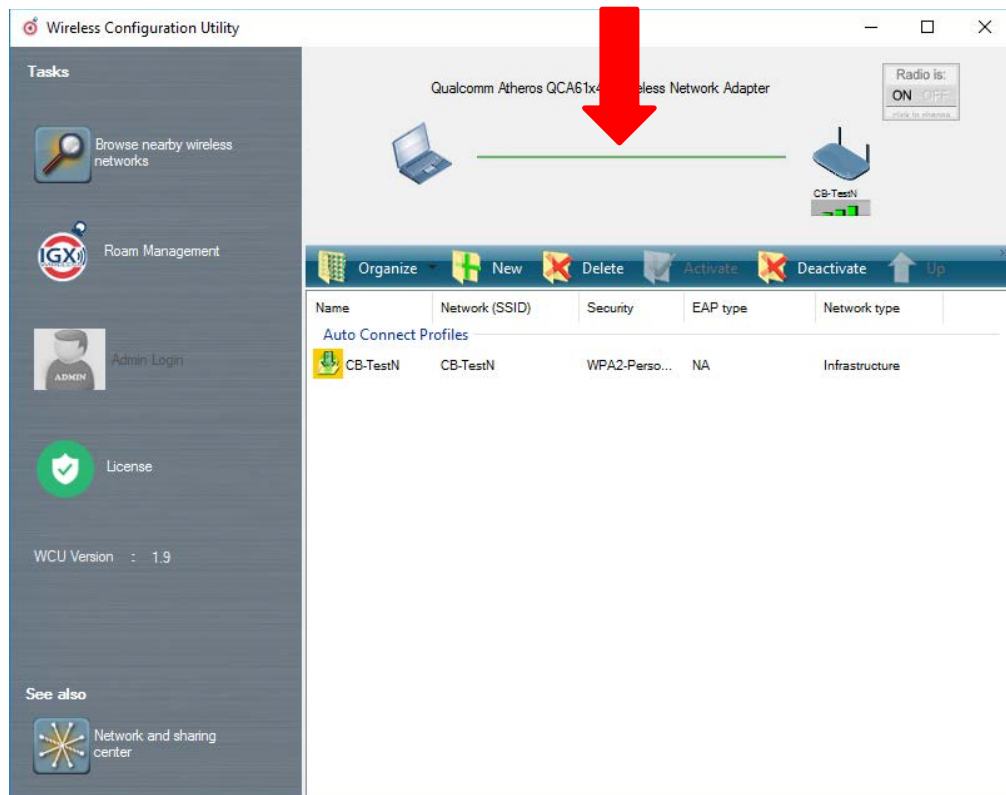


Figure 11.24: Network connection is established

11.6.10. Roam Management

11.6.10.1. General

After clicking the **General** dialog, the following information is displayed on the screen:

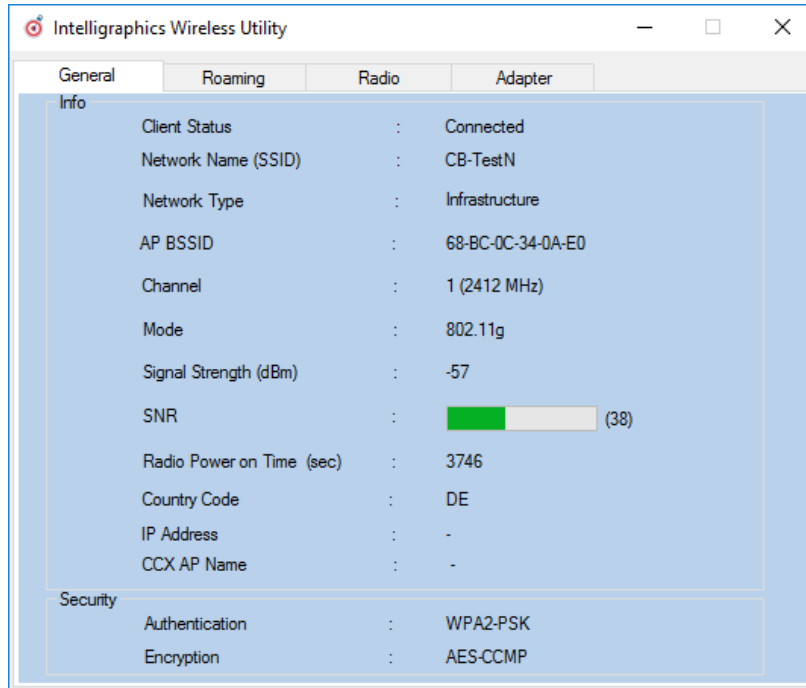


Figure 11.25: General dialog in the Roam Management menu

General

Info	Meaning of the display
Client Status	Current connection status Connected / Disconnected
Network Name SSID	SSID of the currently connected access points
Network Type	Network type Ad-hoc or Infrastructure
AP BSSID	Corresponding MAC address of the currently connected access points
Channel	Displays the configured channel used in the access point
Mode	Frequency band used, e.g. "802.11g"
Signal Strength (dBm)	Current signal strength of the connected access points in (dBm)
SNR	Relative signal strength (SNR) as bar chart
Radio Power on Time (sec)	Display of the current elapsed operating time of the Radio card
Country Code	The country code supplied by the access point such as US, DE, JP
IP Address	The Client IP address configured by the access point (DHCP) or manually (static) assigned
CCX AP Name	SSID of the Cisco CCX Access Points (if present)

Security

Authentication	The authentication process used, e.g. WPA2-PSK (Pre-Shared-Key)
----------------	--

Encryption	Display of the corresponding encryption process, e.g. (AES-CCMP, TKIP)
------------	---

11.6.10.2. Roaming

The **Roaming** dialog is used to define the following parameters:

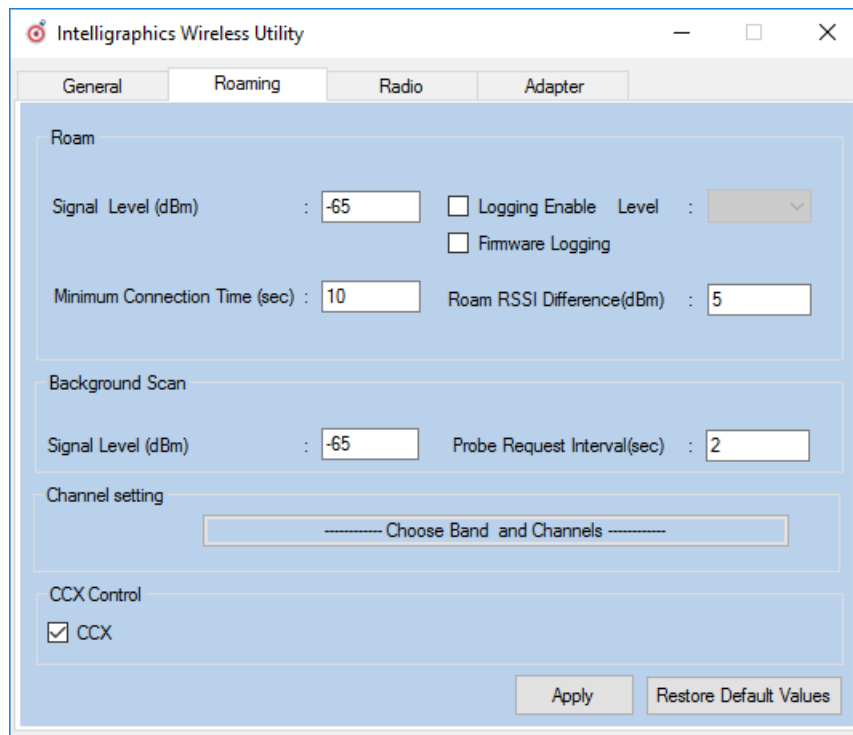


Figure 11.26: Roaming dialog in the Roam Management menu

Roam

Signal Level (dBm):	This setting defines when the client is to begin the roaming process. Possible values: -55 dBm to -80 dBm Default value: -65 dBm (adjustable in 5 dBm increments)
Minimum Connection Time (sec)	This setting defines how long the client is to remain connected to the current access point before roaming to the new access point starts. Possible values: 5 to 25 seconds Default value: 10 seconds
Logging Enable Level	This setting can be used to define that the activities of the driver are recorded in a log. Two levels are available: Critical and All . Critical : If the debug level is set to Critical , only the critical messages from the driver will be recorded. All : If the debug level is set to All , all messages from the driver will be recorded. The log file is saved in the C:\WlanLogs folder and a current timestamp is added. If the log file is larger than 100 mb, a new file is created. Note: This option should only be enabled for short periods for analysis purposes, not permanently!

Firmware Logging	<p>Option can be enabled to create a "Firmware" log.</p> <p>The log file is saved to the C:\WlanLogs folder and is assigned the current timestamp and the extension _fw.</p> <p>If the log file is larger than 100 mb, a new file is created.</p> <p>Note:</p> <p>This option should only be enabled for short periods for analysis purposes, not permanently!</p>
Roam RSSI Difference (dBm)	<p>The client will not connect to the new access point until the defined RSSI difference between the new visible access point and the currently connected access point is reached.</p> <p>Possible values: 5 dBm to 25 dBm</p> <p>Default value: 5 dBm</p>

Background Scan

Signal Level (dBm)	<p>This setting defines when the client is to begin the background scan.</p> <p>Possible values: -55 dBm to -80 dBm</p> <p>Default value: -65 dBm</p>
Probe request interval	<p>This setting is used to define how frequently the probes are to be sent when the client is in the "Connected" status.</p> <p>The minimum value here is 1 second.</p> <p>The maximum value is 10 seconds.</p> <p>Each scan process (repetition) takes 4 to 5 seconds.</p>

Clicking the **Choose Band and Channels** button opens the following dialog:

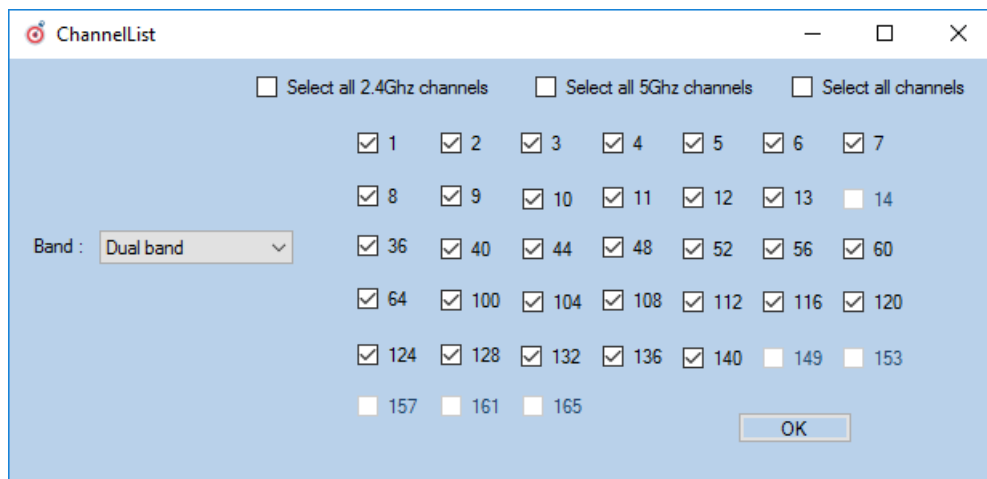


Figure 11.27: Roam Management – Choose Band and Channels

Channel List

Select all 2.4Ghz channels	<p>This option can be used for simultaneous pre-selection of all 2.4 GHZ channels 1 to 13 supported by the WLAN driver.</p> <p>Modifications to individual channels can be carried out at any time by clicking the checkboxes for each channel.</p> <p>NOTICE: Country-specific channel settings / residual restrictions on the use of special channels should be set according to the legal guidelines and must be observed!</p>
Select all 5Ghz channels	<p>This option can be used for simultaneous pre-selection of all 5 GHZ channels 36 to 140 supported by the WLAN driver.</p> <p>Modifications to individual channels can be carried out at any time by clicking the checkboxes for each channel.</p> <p>NOTICE: Country-specific channel settings / residual restrictions on the use of special channels should be set according to the legal guidelines and must be observed!</p>
Select all channels	Used to select or de-select the complete channel list 2.4/5 GHZ (to simplify channel selection).
Band	<p>The following selection options are available:</p> <p>2.4 GHz</p> <p>5 GHz</p> <p>Dual band (2.4 GHz and 5 GHz)</p> <p>The corresponding settings mean that only channels occurring in the frequency band are displayed for selection and de-selection.</p>

CCX Control

CCX / CCKM	<p>The CCX specification (<u>Cisco</u>[®]Compatible eXtensions) contains a series of functional extensions to the <u>IEEE 802.11</u> WLAN standard to support rapid roaming (CCKM): with improved security, reliability and diagnostic performance.</p> <p>The CCX specification is a brand from Cisco[®] and requires a license agreement to be able to equip mobile devices with this technology.</p> <p>Currently the CCX versions 4 (CCXv4) and 5 (CCXv5) are supported.</p>
------------	--

11.6.10.3. Radio Tab

The **Radio** dialog is used to define the following parameters:

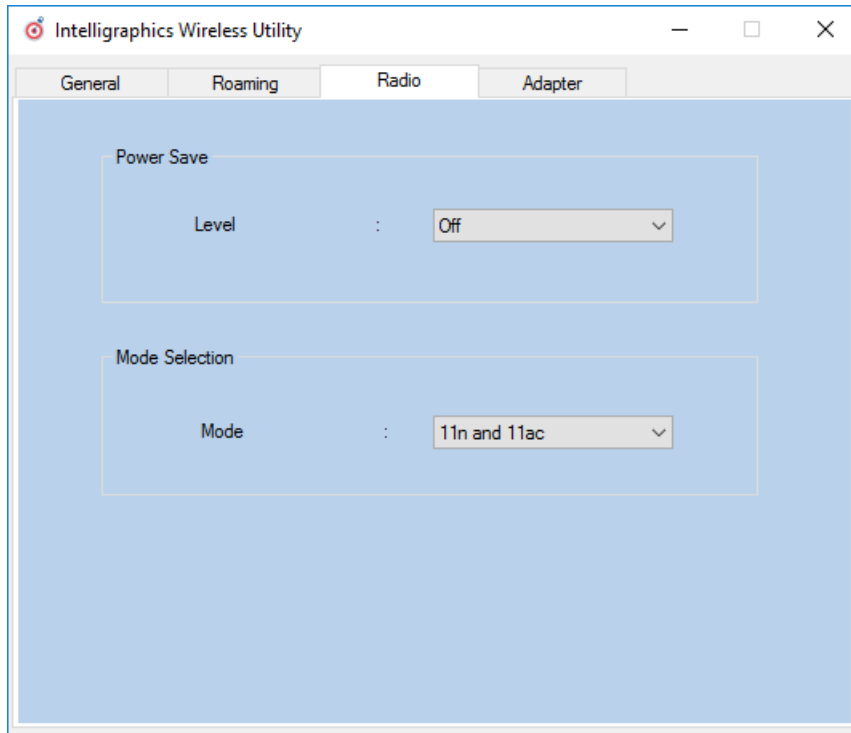


Figure 11.28: Radio dialog in the Roam Management menu

Power Save	The Power Save Level is set. The levels OFF and Auto-PSM are available.
Mode Selection	The band of the client is specified. The possible options are: 11n and 11ac / 11n / 11a/b/g

11.6.10.4. Adapter Tab

After clicking the **Adapter** dialog, the following information is displayed on the screen:

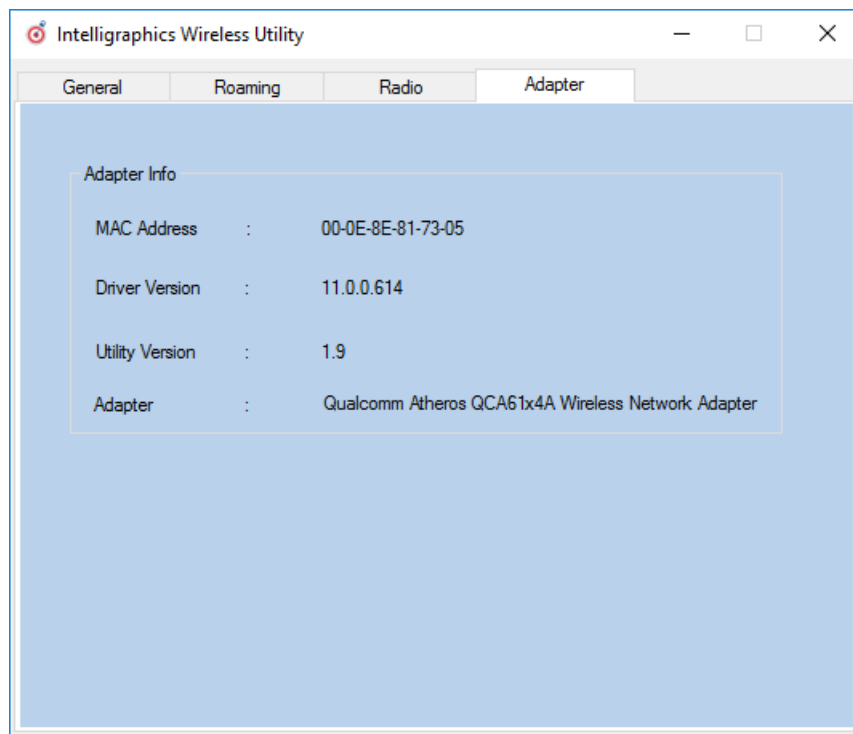
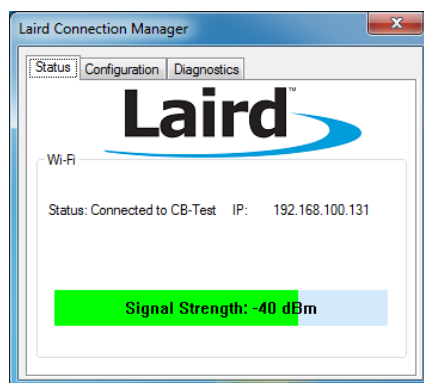


Figure 11.29: Adapter Tab in Roam Management menu

11.6.11. Laird Connection Manager (LCM)

Start LCM:

- ⇒ By clicking the **LCM** icon on the desktop
- ⇒ Or by choosing **Start > Programs > Summit > Laird Connection Manager**.



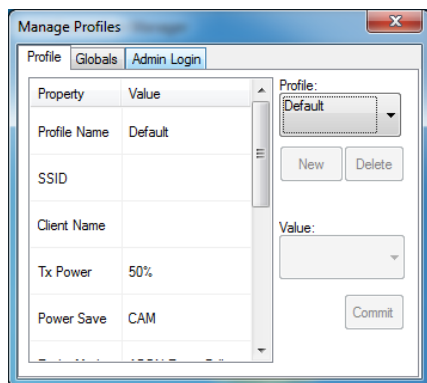
- ⇒ Depending on the configuration, you may have to enter a password.
- ⇒ To do this, click **Configuration**.

Fig. 11.30: Initial Laird Connection Manager dialog box



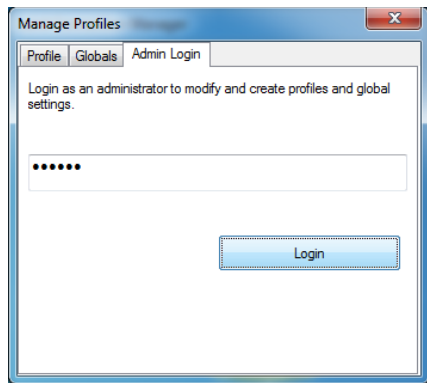
⇒ Click on **Manage Profiles**.

Fig. 11.31: LCM Configuration tab with the Manage Profiles button



⇒ Click the **Admin Login** tab.

Fig. 11.32: LCM Manage Profiles dialog box with the Admin Login tab



⇒ Default password: **SUMMIT**
(Must be entered in upper-case characters.)

Fig. 11.33: Entering the LCM password: SUMMIT

12. WWAN configuration

12.1. Safety notice



CAUTION

Danger of radiation emission.

DLT-V83 devices with radio technology emit high frequency energy (abbreviation: HF). To protect persons against HF radiation:

- ⇒ Mount the DLT-V83 so that persons and domestic animals maintain a minimum distance of 20 to 50 cm from the radio antennas.
- ⇒ Ensure that persons observe this minimum distance when operating the DLT-V83.
- ⇒ High frequency energy can interfere with technical devices. For this reason, do not use the DLT-V83 in the vicinity of pacemakers or other medical devices.
- ⇒ Only operate the DLT-V83 with radio modules that are approved by the manufacturer for this device.
- ⇒ Make sure that the transmission power and the radio frequency of the DLT-V83 comply with the regulations for the respective country where the device is deployed.
- ⇒ Observe all applicable regulations for your deployment location/country with regard to operating channels, radio frequencies and the maximum permissible transmitting power. Responsibility for this lies with the company operating the DLT-V83. The regulatory authorities in the relevant country can provide information on this.

Any modifications to the DLT-V83 which are not expressly approved by the party responsible for the compliance can lead to the withdrawal of the operating license for this device.

Examples of country-specific regulations:

<u>Region:</u>	<u>Radio approval:</u>
EU	RED (formerly R&TTE)
China	SRRC
Japan	MIC (formerly TELEC)
Taiwan	NCC
Canada	Canada IC
USA	FCC

Antenna solutions for use in Germany

The Advantech antenna solutions are based on the prevailing IEEE 802.11 standard. This standard allows radio data transfer at rates from 1 Mbps to 54 Mbps (300 Mbps if using IEEE 802.11n) using the 2.4 GHz and 5 GHz frequency band.

Information on radio performance

The consistency of the radio performance is dependent on the following factors:

- Radio card (set transmission power)
- Connecting cables
- Antenna gain

Help table for the correct setting:

Translation between mW and dBm																							
dBm	-1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
mW	1	2	3	4	5	6	8	10	12	15	20	25	30	40	50	60	80	100	125	150	200	250	

12.2. Differences between MS Windows and Linux

The radio configuration of the DLT-V83 with MS Windows operating system is described in the following manual sections.

The radio configuration of the DLT-V83 with Linux is described in the “Advantech Linux Manual”.



Please contact our Technical Customer Support if required.

12.3. Preparation work at the factory (DLT-V83 delivery status)

The following preparations have already been carried out at the factory for the optional WWAN functionality of the DLT-V83:

- The WWAN card and the corresponding drivers are installed.
- GNSS is enabled at the factory

NOTICE: Property damage

No access to radio cards in the DLT-V83

Radio cards are located inside the devices and are not accessible from the outside.

Only the manufacturer and its authorized service centers may open the device and install/remove radio cards.

12.4. SIM card for WWAN (customer-specific)

A SIM card is required in addition to the WWAN card.

The SIM card must be plugged in by the client into the SIM card slot underneath the DLT-V83 antenna.

NOTICE: Property damage

Inserting the SIM card: DLT-V83 must be switched off

For more details, see the chapter *8.3 Open/close antenna*.

NOTE

If the SIM card contains a PIN, the customer must set up an application for the PIN query.

For this reason, we recommend not using a PIN.

12.5. Configuration of radio card SIERRA WIRELESS MC80

The following information applies for the radio card **SIERRA WIRELESS MC80**. Its precise designation is:

- USA: SIERRA WIRELESS MC8090
- Europe: SIERRA WIRELESS MC8092

The WWAN configuration is identical for both Radio cards. For this reason, the abbreviation **SIERRA WIRELESS MC80** is used.

NOTE

In the section below, the provider **Vodafone** is used as an example.

⇒ Adjust the settings for your provider.

12.5.1. Open device manager

⇒ Check whether or not the **Sierra Wireless HSPA Modem** is present in the list of modems.



Fig. 12.1: SIERRA WIRELESS MC80 - Device manager, Sierra Wireless HSPA Modem

⇒ Display the **Properties** window of the **Sierra Wireless HSPA Modems** (left mouse button).

⇒ Click the **Advanced** tab.



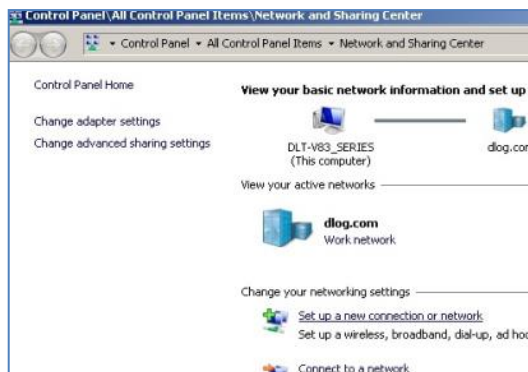
In the **Advanced** tab, enter the APN of the provider:

e.g. **+CGDCONT=1,"IP","web.vodafone.de"**

Then click **OK**.

Fig. 12.2: SIERRA WIRELESS MC80 - Sierra Wireless HSPA Modem - Properties

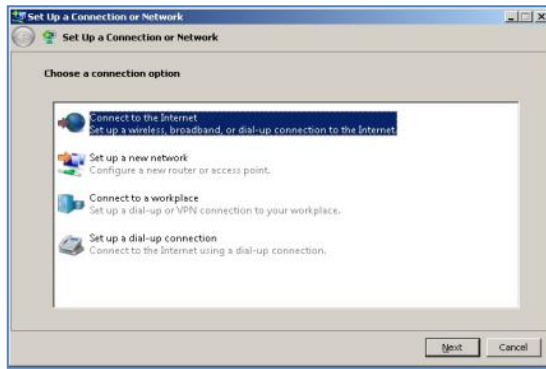
12.5.2. Establish Internet connection



⇒ Open the **Network and Sharing Center**.

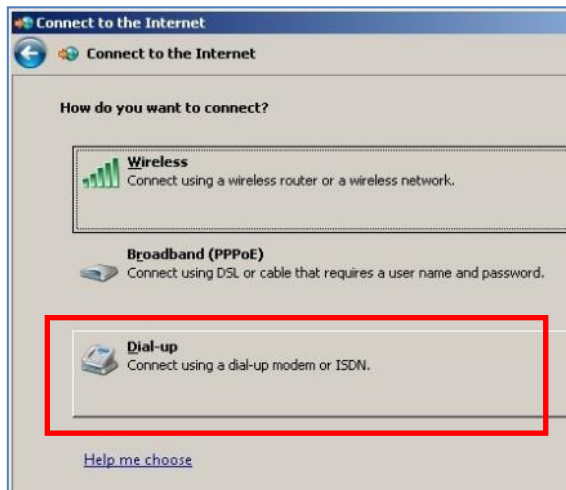
⇒ Click **Set up a new connection or network**.

Fig. 12.3: SIERRA WIRELESS MC80 - Set up a new connection or network



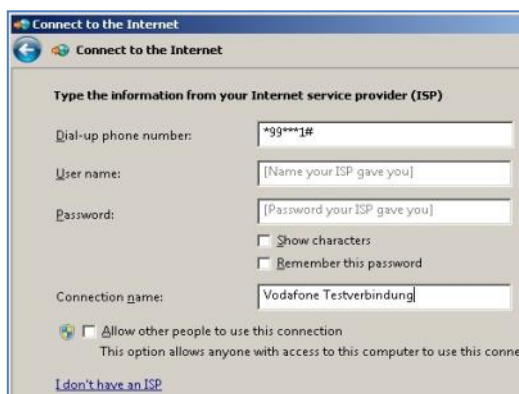
⇒ **Connect to the Internet** - select and confirm.

Fig. 12.4: SIERRA WIRELESS MC80 - Connect to the Internet



⇒ Select the **Dial-up** field.

Fig. 12.5: SIERRA WIRELESS MC80 - Connect to the Internet - Dial-up



- ⇒ Specify as a telephone number, e.g. ***99***1#**.
- ⇒ Enter a connection name, e.g. **Vodafone test connection**.
- ⇒ Username and password are not required in the example (provider-dependent).

Fig. 12.6: SIERRA WIRELESS MC80 - Telephone number and connection name

⇒ Open the Vodafone test connection under **Network connections**.



Fig. 12.7: SIERRA WIRELESS MC80 - Network connections - Vodafone test connection



- ⇒ Do not enter a user name or password.
- ⇒ Click **Dial**.

The test connection is established.

Fig. 12.8: SIERRA WIRELESS MC80 – Dial test connection

In the **Network and activation center** of the device, the status of the test connection can be tested:

- ⇒ Right-click the network and then select **Status**.

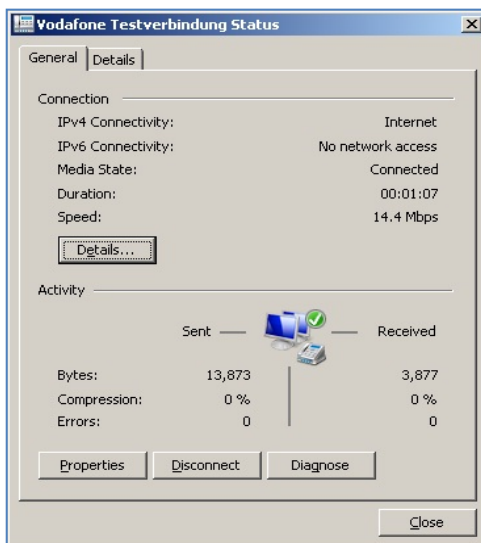


Fig. 12.9: SIERRA WIRELESS MC80 - Function test GSM / GNSS, test connection status

12.5.3. SIERRA WIRELESS MC80 Trouble Shooting

12.5.3.1. Testing the virtual COM ports for Wireless card SIERRA WIRELESS MC80

In the device manager it is possible to test that the virtual COM ports are correctly set. If they are not correctly set, they must be modified as appropriate.

DLT-V83 with D525 processor:

The virtual COM ports must be set up as shown in the figure:

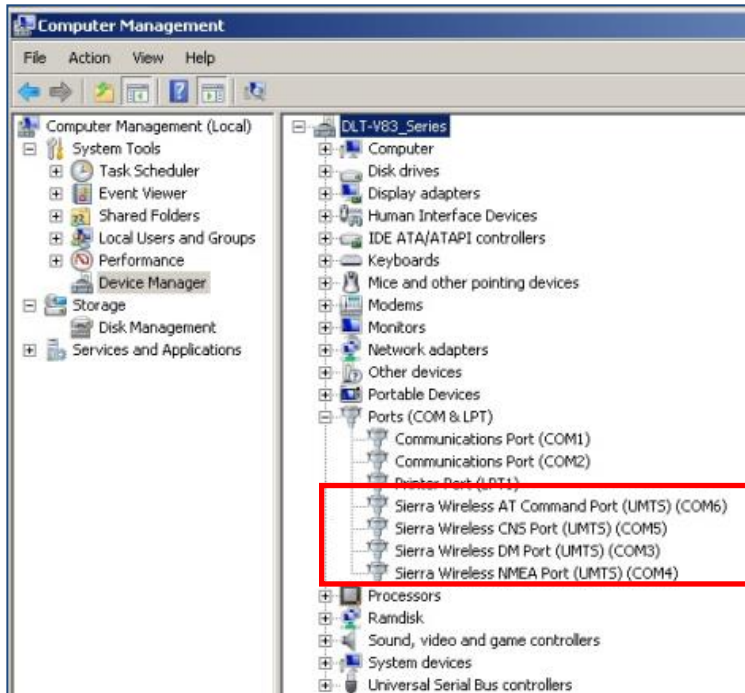


Fig. 12.10: SIERRA WIRELESS MC80 - Virtual COM ports DLT-V83 with D525 processor

DLT-V83 with i5 processor:

The virtual COM ports must be set up as shown in the figure:

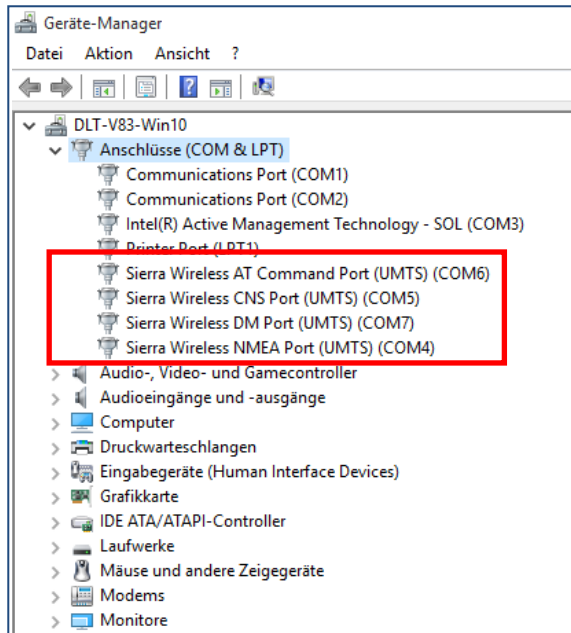


Fig. 12.11: SIERRA WIRELESS MC80 - Virtual COM ports DLT-V83 with i5 processor

DLT-V83 with Celeron processor:

The virtual COM ports must be set up as shown in the figure:

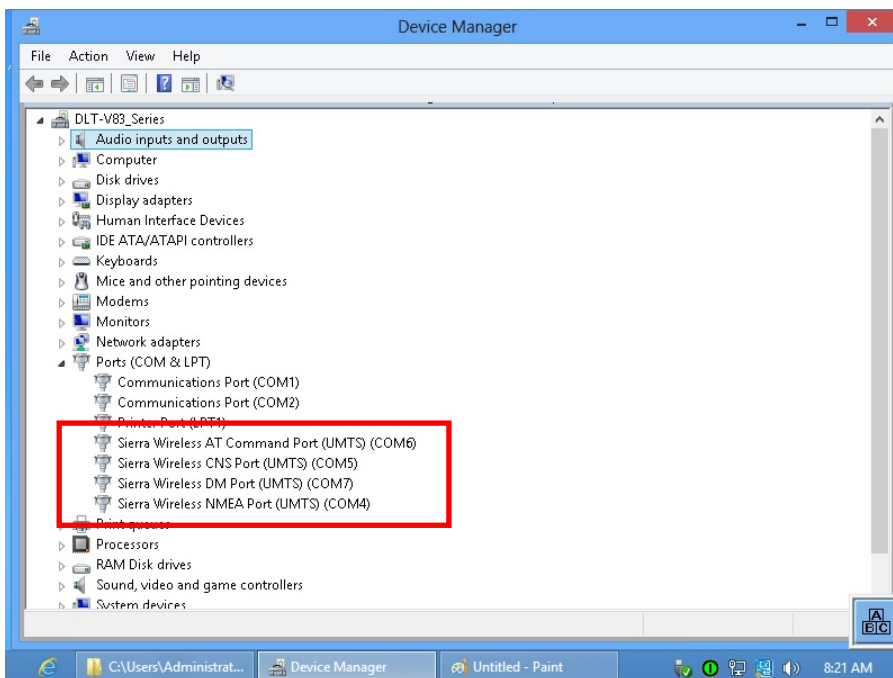


Fig. 12.12: SIERRA WIRELESS MC80 - Virtual COM ports DLT-V83 with Celeron processor

12.5.3.2. Test communication between DLT-V83 and WWAN Radio card

The open source software **Tera Term**, for example, can be used to test that the DLT-V83 can communicate with the Radio card.

This software can be downloaded from the following URL, for example (website available at time of writing this operating manual, dated Feb 2019):

<https://www.heise.de/download/product/tera-term-51776>

Perform the following steps:

- ⇒ Open the AT port via **Tera Term**.
- ⇒ Connect to the AT port.
- ⇒ In the AT port, enter the command **AT**.

If the response received is **OK**, communication is present.

12.5.3.3. Test that GNSS data can be received

The open source software **Tera Term**, for example, can be used to test that GNSS data can be received. Availability of the software: see previous section.

Perform the following steps:

- ⇒ Open the NMEA port via **Tera Term**.
- ⇒ Test that NMEA data are received.
Enabled data flows are displayed.

Example:

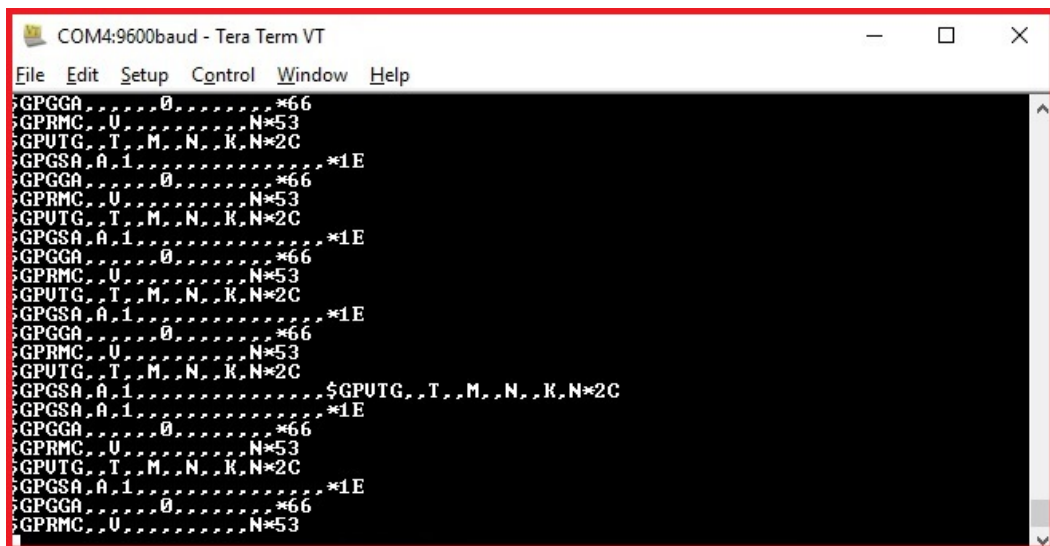


Fig. 12.13: SIERRA WIRELESS MC80 - test NMEA data flows

12.6. Configuration of Radio card QUECTEL EC25

The following information is valid for the Radio card **QUECTEL EC25**. Its precise designation is:

- USA: QUECTEL EC25A or EC25V
- Europe: QUECTEL EC25E

The WWAN configuration is identical for both Radio cards. For this reason, the abbreviation **QUECTEL EC25** is used.

12.6.1. Establish Internet connection

NOTE

In the section below, the provider **Vodafone** is used as an example.

⇒ Adjust the settings for your provider.



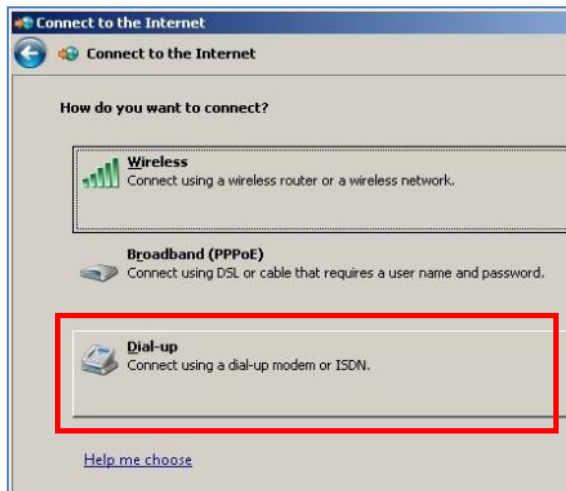
- ⇒ Open the **Network and Sharing Center**.
- ⇒ Click **Set up a new connection or network**.

Fig. 12.14: QUECTEL EC25 - Set up a new connection or network



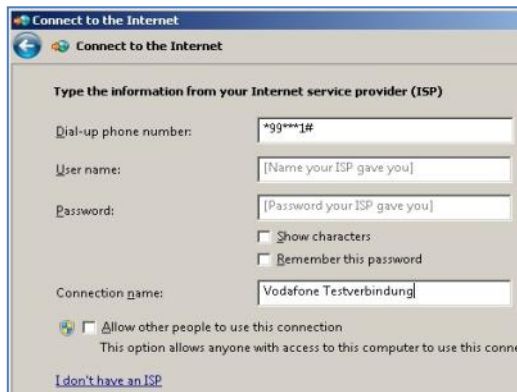
- ⇒ **Connect to the Internet** - select and confirm.

Fig. 12.15: QUECTEL EC25 - Connect to the Internet



⇒ Click **Dial-up**.

Fig. 12.16: QUECTEL EC25 - Connect to the Internet - Dial-up



- ⇒ Specify as a telephone number, e.g. ***99***1#**.
- ⇒ Enter a connection name, e.g. **Vodafone test connection**.
- ⇒ Username and password are not required in the example. (Provider-dependent)

Fig. 12.17: QUECTEL EC25 - Connect to the Internet - Telephone number

⇒ Open the Vodafone test connection under **Network connections**.

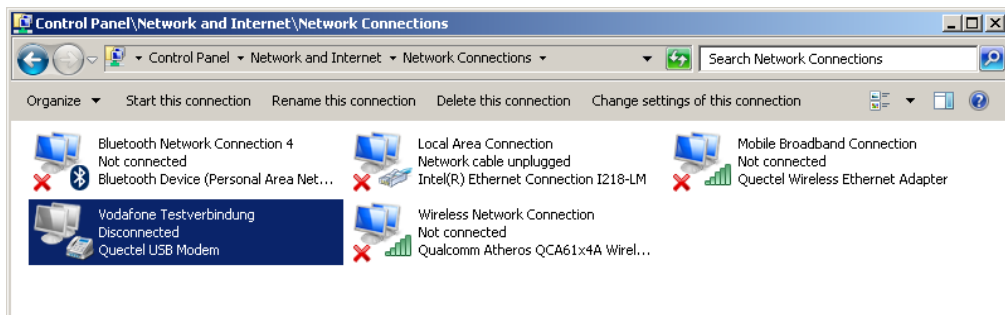


Fig. 12.18: QUECTEL EC25 - Network connections - Vodafone test connection



- ⇒ Do not enter a user name or password.
- ⇒ Click **Dial**.

The test connection is established.

Fig. 12.19: QUECTEL EC25 - Dial Vodafone test connection

In the **Network and activation center** of the device, the status of the test connection can be tested:

- ⇒ Right-click the network and then select **Status**.

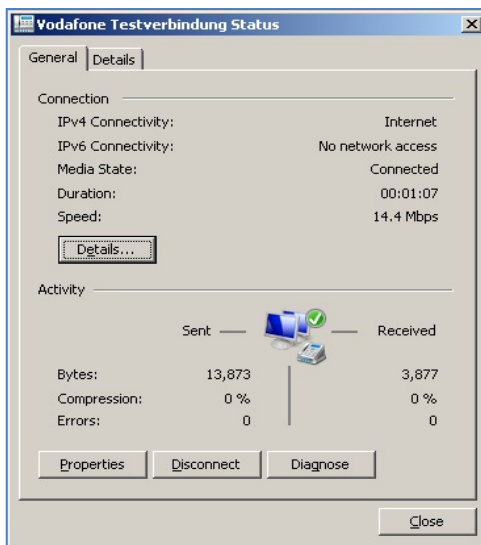


Fig. 12.20: QUECTEL EC25 - Function test GSM / GNSS, test connection status

12.6.2. QUECTEL EC25 Trouble Shooting

12.6.2.1. Test virtual COM ports

In the device manager it is possible to test that the virtual COM ports are correctly set. If they are not correctly set, they must be modified as appropriate.

DLT-V83 with i5 processor

The virtual COM ports must be set up as shown in the figure:

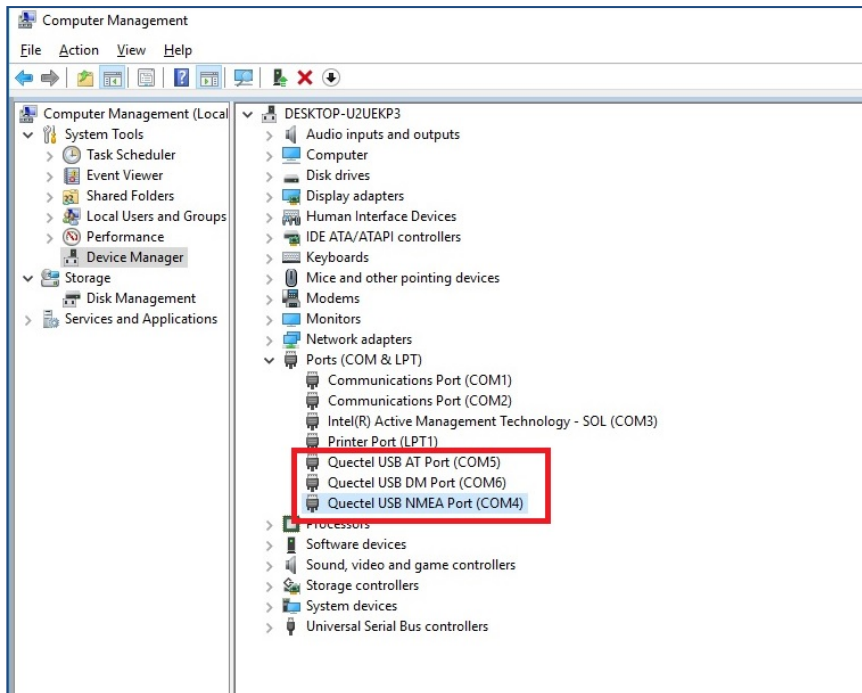


Fig. 12.21: QUECTEL EC25 - Virtual COM ports DLT-V83 with i5 processor

DLT-V83 with Celeron processor

The virtual COM ports must be set up as shown in the figure:

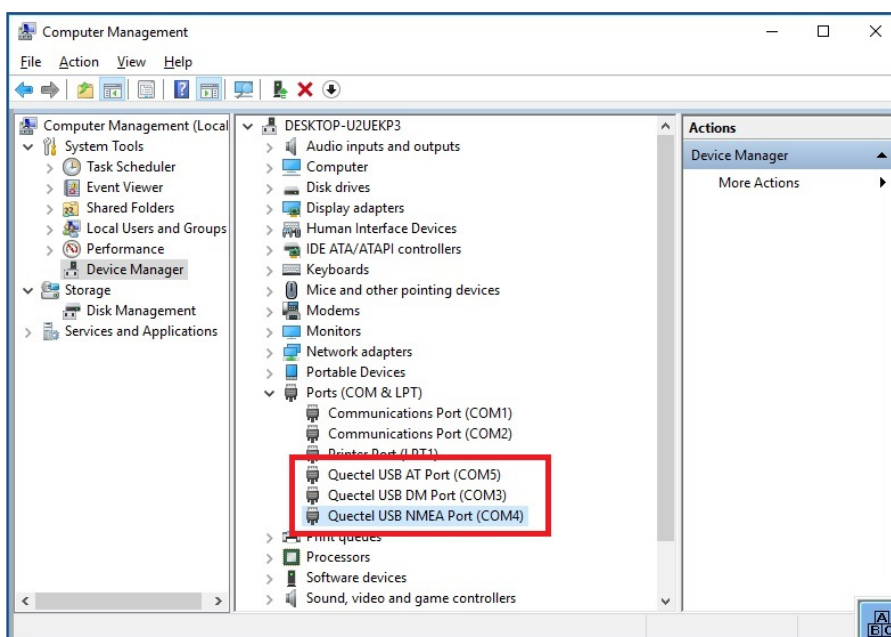


Fig. 12.22: QUECTEL EC25 - Virtual COM ports DLT-V83 with Celeron processor

12.6.2.2. Test communication between DLT-V83 and WWAN Radio card

The open source software **Tera Term**, for example, can be used to test that the DLT-V83 can communicate with the Radio card.

This software can be downloaded from the following URL, for example (website available at time of writing this operating manual, dated Feb 2019):

<https://www.heise.de/download/product/tera-term-51776>

Perform the following steps:

- ⇒ Open the AT port via **Tera Term**.
- ⇒ Connect to the AT port.
- ⇒ In the AT port, enter the command **AT**.

If the response received is **OK**, communication is present.

12.6.2.3. Test that GNSS data can be received

The open source software **Tera Term**, for example, can be used to test that GNSS data can be received. Availability of the software: see previous section.

Perform the following steps:

- ⇒ Open the NMEA port via **Tera Term**.
- ⇒ Test that NMEA data are received.
Enabled data flows are displayed.

13. Mechanical mounting

13.1. Warning about injuries and Property damage



WARNING

Risk of personal injury and Property damage due to improper installation and commissioning.

Only authorized skilled personnel are permitted to install and commission the DLT-V83. Moreover, specialized knowledge about battery packs and the applicable safety regulations is also required for DLT-V83 Industrial Computers with integrated UPS (optional).

If the DLT-V83 is incorrectly installed and placed into operation, any warranty for this device will be rendered void.

Risk of injury due to the weight of the device

The DLT-V83 can fall down and cause injuries due to its weight.

- ⇒ Always hold the device by the housing with both hands.
- ⇒ Never use the antenna cap as a handle. It can break due to the weight involved.
- ⇒ Use the assistance of a second person for installation work.
- ⇒ The installation height of the device shall not exceed 2 m.

Risk of injury due to sharp-edged parts on the device

The strain relief rail of the DLT-V83 can have sharp edges and cause cutting injuries.

- ⇒ Do not hold the device by the strain relief rail.

Risk of injury and damage due to improper deployment location.

- ⇒ Observe the intended use of the DLT-V83, e.g. not in potentially explosive areas, not in life-supporting facilities.
- ⇒ Observe that the deployment location of the DLT-V83 must comply with the permissible environmental conditions.
- ⇒ The installation height of the device shall not exceed 2 m.

Danger if mounting bracket breaks

- ⇒ When installing the DLT-V83, make sure that no one will be injured if the bracket breaks (e.g. because of a stress fracture).
- ⇒ Alternatively please put appropriate safety measures in place (e.g. install a security cable in addition to the mounting bracket).

Radio wave emission in the vicinity of persons.

To ensure that the limits set for exposure to radio waves are not exceeded:

- ⇒ Install the DLT-V83 so that persons maintain a minimum distance of 20 to 50 cm to the antenna.

NOTICE: Property damage

Installation environment without cooling air can overheat/damage the DLT-V83.

The DLT-V83 employs a passive cooling concept whereby the waste heat generated inside the device is emitted from the surface of the housing. For this system to function properly, sufficient fresh air circulation is required.

- ⇒ Never install the system in a closed environment where the cooling air is unable to dissipate accumulated heat to the outside.
- ⇒ The maximum permissible ambient temperature for the entire system needs to be taken into account for the specific application area.

Damage and scratching of the touchscreen without transport protective film.

The front display of the DLT-V83 is protected during transport by a transparent film. This film should remain on the front display during assembly to avoid damage to the front display surface.

- ⇒ Only remove the film after all of the installation work has been completed

13.1.1. Important: Installation of the DLT-V83 on vehicles**WARNING**

Observe the requirements of the vehicle manufacturer.

- ⇒ Observe the requirements of the vehicle manufacturer for the attachment of auxiliary devices and the connection of auxiliary consumers.
- ⇒ Observe all requirements that relate to welding or drilling support parts.

Risk of accident on vehicles due to limited field of view of the driver.

- ⇒ Inside the vehicle the driver's field of vision must remain free.
- ⇒ During installation, plan for sufficient space for the DLT-V83 and accessories.
- ⇒ Make sure that the driver's field of vision is not restricted in a prohibited.
- ⇒ No part of the DLT-V83 system may project beyond the vehicle.

Risk of accident on vehicles due to unexpected vehicle emergency stop because of electro conductive connection of the DLT-V83 to the vehicle chassis

Due to a variety of technical properties of forklifts and forklift trucks, it can be necessary to electrically isolate DLT-V83 from the chassis of the vehicle to prevent malfunctions. The necessity of this must be studied on a case-by-case basis, however, it is recommended for vehicles with potential-free chassis.

For example, using rubber buffers ensures that the terminal has no electrically conducting connection to the vehicle chassis.

If peripheral equipment (such as scanners, printers, scales or similar), which has its own power supply unit is used, you must ensure that the power supply units of these peripherals are galvanically separated from the supply of the vehicle.

Moreover, the peripheral equipment and its cabling must be attached electrically isolated.

If external antennas are being used, you must ensure that the antennas are isolated at the mounting point on the vehicle chassis.

13.2. Overview of mounting steps

Requirement: The vehicle/installation location must be prepared (e.g. connection to the ignition, correct voltage, etc.)

We recommend the following sequence for the mechanical and electrical installation:

- Determine a suitable mounting position for the DLT-V83.
- Secure device mounting (mounting bracket, RAM mount; optional).
- Connect external accessories to the DLT-V83.
- Install an easily accessible disconnecting device, such as a switch.
- Connection to the power supply.
- Seal cable bushings with cable grommets and dummy grommets.
- Close the DLT-V83 with cable cover.
- Mount the DLT-V83 on the device mounting bracket (follow mounting instructions).

13.3. Connecting external accessories to the DLT-V83

The DLT-V83 must be disconnected from the power supply:

- before external devices (e.g. scanner, keyboard) are connected or disconnected.
- before using the interfaces underneath the antenna.
- and before the DLT-V83 is connected to a network.

NOTICE: Property damage

Observe the following when connecting/removing external devices:

- ⇒ Only use accessories that have been tested and approved by Advantech for the respective DLT-V83.
- ⇒ The DLT-V83 may not be connected to the power supply if external devices are being connected/removed (not applicable for USB devices). Otherwise considerable damage could be caused to both the DLT-V83 and the peripheral devices.
- ⇒ Make sure that peripherals with their own power supply are either switched on at the same time as the DLT-V83 or after the start of the DLT-V83.
- ⇒ Otherwise, you must ensure that a backflow from the external device to the DLT-V83 cannot take place.
- ⇒ Only power up the DLT-V83 when all devices have been connected and the DLT-V83 has been closed correctly (remember the cable cover!). Otherwise, you may damage the DLT-V83.



Please observe the mounting instructions supplied with the optional accessories.

13.4. Attaching device mounting and accessory mounting (optional)

Observe the following information about the mounting brackets:

- All mounting brackets and mounting parts supplied by Advantech are only intended to be used for attachment of the Industrial Computers and the peripheral devices and may not be misused.
- Only use suitable mounting brackets and screws permitted by Advantech.
- Ensure that ball-and-socket bases and mounting brackets are always attached correctly.



WARNING

Risk of accident on vehicles if the mounting becomes loose.

- Mechanical expert knowledge is required for correct attachment of device mounts and accessory mounts on the DLT-V83.
- Use suitable mounting material.
- Observe the maximum screw-in depth of the holes of the DLT-V83:
- The recommended screw-in depth of $D \times 1$ always applies (screw diameter \times 1).
- NOTICE: Screws that are too long, e.g. in the VESA mounting holes, can pierce the rear side of the DLT-V83 and cause irreparable damage to the device.

13.4.1. VESA drill holes

VESA-compatible drilling patterns for the RAM attachment and swivel joint brackets are located on the rear side of the DLT-V83.

DLT-V8310 VESA drill holes

Dimensions without add-ons (in mm)

Depth of thread: M6 x 6mm

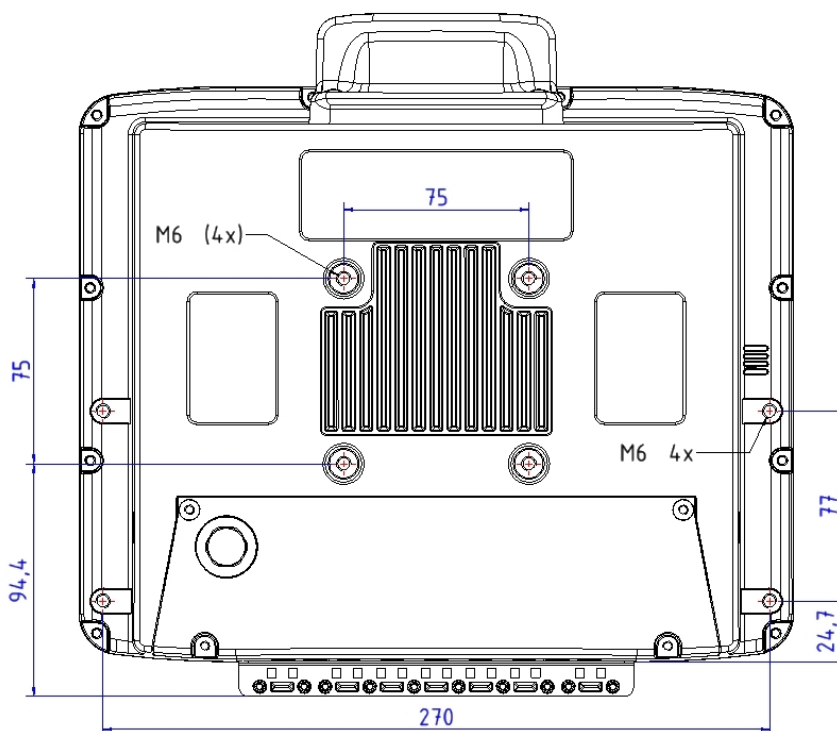


Fig. 13.1: Position of the VESA drill holes DLT-V8310

DLT-V8312 VESA drill holes

Dimensions without add-ons (in mm)

Depth of thread: M6 x 6mm

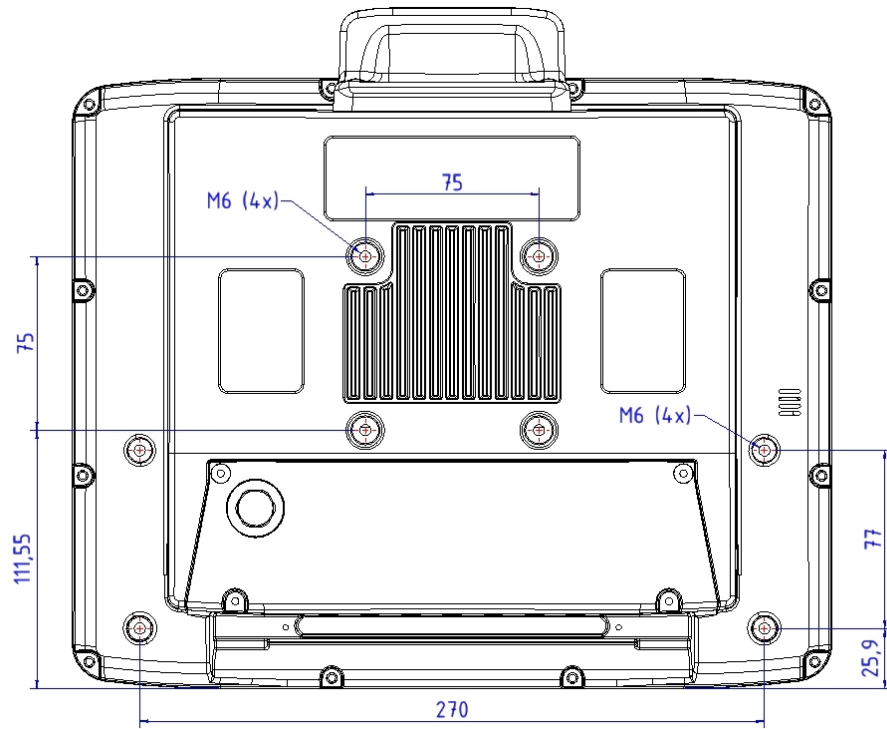


Fig. 13.2: Position of the VESA drill holes DLT-V8312

DLT-V8315 VESA drill holes

Dimensions without add-ons (in mm)

Depth of thread: M6 x 6mm

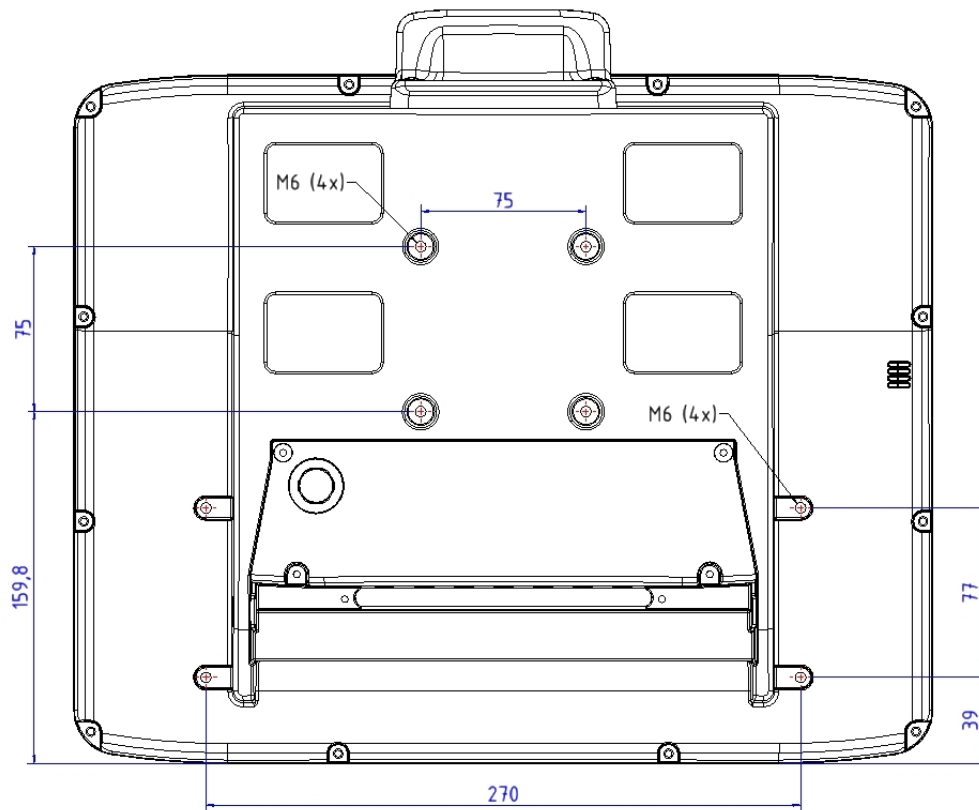


Fig. 13.3: Position of the VESA drill holes DLT-V8315

14. Electrical connection

14.1. Connection to the power supply



WARNING

Risk of injury and damage due to improper electrical connection.

Only authorized skilled personnel are permitted to perform the electrical connection of the DLT-V83. Moreover, specialized knowledge about battery packs and the applicable safety regulations is also required for DLT-V83 Industrial Computers with integrated UPS (optional).

If the electrical connection of the DLT-V83 is performed improperly, any warranty for this device will be void.

- ⇒ Comply with the appropriate national installation regulations for the cable routing.
- ⇒ Do not connect/disconnect any cables during thunderstorms.
- ⇒ When working on the cable cover with UPS battery packs you must remove wristwatches, rings or other metal objects.

Power supply unit fuse blows repeatedly

If the fuse of the integrated power supply units blows again immediately after replacement, there is a risk of electrical shock:

- ⇒ Send in the DLT-V83 immediately for repair.

Electrical shock due to lack of disconnecting device.

DLT-V83 Industrial Computers are not equipped with disconnecting devices that are accessible from the outside; they do not have switches. To enable the devices to be quickly disconnected from the power supply in emergency situations:

- ⇒ Install an easily accessible disconnecting device close to the device.
- ⇒ Make sure that the disconnecting device disconnects all power supply lines.

Please note: For DLT-V83 devices with integrated UPS the device may be in operation despite the disconnecting device being actuated, since it is supplied with power by the UPS.

14.2. Connecting DC devices to the power supply

DLT-V83 is available with a galvanically separated, integrated DC power supply. Power is connected to the back of the device using a Phoenix contact connector. There is no power switch for the mains voltage.



WARNING

Hazardous voltage, electric shock on the DLT-V83 with DC power supply unit.

- ⇒ Do not put the DLT-V83 into operation if it is damaged.
- ⇒ Do not open or modify the DLT-V83.
- ⇒ Only connect or disconnect electrical connections when the device is in a de-energized state (electrically dead).
- ⇒ Use only original power supply cables from Advantech. Advantech power cables meet the specific requirements for low-temperature flexibility, UV resistance, oil resistance, etc. If other power supply cables are used: The user/operator of the DLT-V83 is solely responsible for the resulting damage.
- ⇒ Make sure that the power supply cables are run without kinks and are mechanically protected (securely protected against crushing and abrading).
- ⇒ The DC+ connecting cable must be protected by a fuse (30 AT max.).
- ⇒ The ignition connecting cable must be protected by a fuse of the following type: 5x20 mm T 125 mA L / 250 V, for example, a Wickmann 195-125 mA / 250 V.
- ⇒ Observe correct voltage ranges.
- ⇒ Ensure that power supply cable is fused correctly.
- ⇒ Observe the labeling on the cable and connect the power supply cable with the correct polarity.
- ⇒ Cut the supply cable to the minimum length. This avoids tangled cables and improves the quality of the power supply.
- ⇒ Connect the power supply cable to a suitable place. Ensure that the connecting cable has an adequate cross section and ampacity at the connection point.
- ⇒ DLT-V83 Industrial Computers with DC power supply unit may only be connected to a SELV circuit (Safety Extra Low Voltage).



Fig. 14.1: DC connection cable with Phoenix contact connector

14.2.1. Important: Electrical connection of the DLT-V83 to vehicles



DANGER

Danger to life due to electric shock.

- ⇒ Ground the DLT-V83 in accordance with the vehicle manufacturer's instructions.
- ⇒ Observe the vehicle manufacturer's instructions for connecting additional loads, for example, in conjunction with an emergency shut-off switch.
- ⇒ Be sure that the connection of the power supply cables is as direct as possible to the battery and not to power supply cables with a great deal of interference (e.g. the motor power supply) or otherwise affected by consumers.

Electrical shock due to insufficient EMERGENCY shut-off of the vehicle.

If the EMERGENCY-OFF switch of the vehicle does not switch off the DLT-V83, there is a risk of electrical shock.

- ⇒ Install the DLT-V83 and the EMERGENCY-OFF switch so that the DLT-V83 also switches off when the EMERGENCY-OFF switch is operated.

Observe: If a DLT-V83 with integrated UPS is installed in a vehicle, the EMERGENCY-OFF switch of the vehicle has no effect on the DLT-V83. This also applies to the peripherals supplied by the device.

14.2.2. Electrical installation of DC devices

Pay special attention to the various electrical potentials when installing the unit on vehicles.

On the DLT-V83, the logic ground and the shield ground are firmly connected to each other.

The "logic ground" is the earth line (GND) for all of the internal electrical components, such as the display and the CPU.

All cable shields and the housing are connected with the shield ground.

Some forklifts have a chassis that is connected to DC+. Therefore, the DLT-V83 chassis is also connected to DC+. If peripheral devices supply DC- to the shield connection of the DLT-V83 by a connection plug, for example over a serial connection, this will cause a short-circuit and malfunctions or power failures will be unavoidable.

In DC-powered devices, always attach ring tongues on the supply voltage cable to the provided ground bolt situated on the connector panel (see *Fig. 14.2: Position of the ground bolt*).

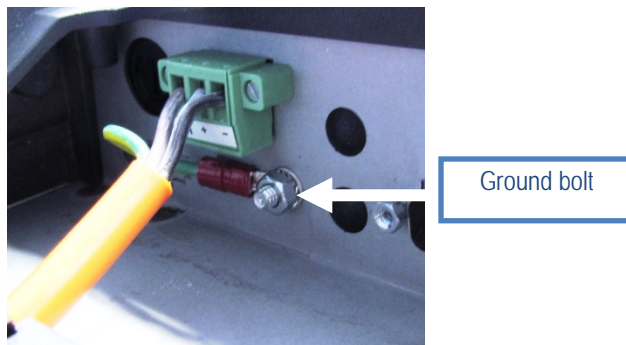


Fig. 14.2: Position of the ground bolt

- The other end of the yellow-green power supply cable must be connected to the vehicle's chassis.
- Connect the power supply cable of the DLT-V83 as close to the battery as possible. Connecting the DLT-V83 to large electrical loads, such as converters for the forklift motor may result in random restarts, malfunctions and/or irreparable damage to the device.
- If you want to connect devices fed by other power sources to the DLT-V83 (e.g. printers), be sure to power up the peripheral devices at the same time or after the DLT-V83; otherwise, you may encounter start-up problems, malfunctions or even irreparable damage to the device.

14.2.3. Electrically isolated installation of DC devices



DANGER

Risk of accident on vehicles due to unexpected vehicle emergency stop because of electro conductive connection of the DLT-V83 to the vehicle chassis.

Due to a variety of technical properties of forklifts and forklift trucks, it can be necessary to electrically isolate DLT-V83 from the chassis of the vehicle to prevent malfunctions. The necessity of this must be studied on a case-by-case basis, however, it is recommended for vehicles with potential-free chassis.

For example, using rubber buffers ensures that the terminal has no electrically conducting connection to the vehicle chassis.

If peripheral equipment (such as scanners, printers, scales or similar), which has its own power supply unit is used, you must ensure that the power supply units of these peripherals are galvanically separated from the supply of the vehicle.

Moreover, the peripheral equipment and its cabling must be attached electrically isolated.

If external antennas are being used, you must ensure that the antennas are isolated at the mounting point on the vehicle chassis.

14.3. Connecting AC devices to the power supply

An integrated, electrically isolated AC power supply unit is available exclusively for the **DLT-V8315** (optional).

The power is connected to the AC power supply unit on the underside of the device using an angled power connector for non-heating apparatus.

The cable of the angled power connector is equipped with an On/Off-switch for the power grid.



DANGER

Danger to life due to hazardous voltage, electric shock on the DLT-V83 with AC power supply unit.

- ⇒ Do not put the device into operation if it is damaged.
- ⇒ Do not open or modify the device.
- ⇒ There is a danger to life if the device is opened while it is connected to the power supply!
- ⇒ Only connect or disconnect electrical connections when the device is in a de-energized state (electrically dead).
- ⇒ When using the AC adapter, make sure that the sum of the current consumption of the system, including the consumers connected via I/O (e.g. scanner) does not exceed the maximum current of the AC adapter, including its supply lines.

14.3.1. Electrical installation of AC devices

When the DLT-V8315 is installed with an AC power supply unit, the electrical potentials must be taken into account.

The DLT-V8315 is connected to protective ground by means of the power connector for non-heating apparatus.

In the DLT-V8315, protective ground, logic ground and shield ground are permanently interconnected.

Logic ground is the ground (GND) used to supply the internal parts and components such as the display or CPU.

All cable shields and the housing are connected to shield ground.

If the terminal is connected to other devices or machines via the existing interfaces (USB, serial, Ethernet, etc.), ensure that the potential of the relevant protective ground is as equal as possible (equipotential bonding strip).

Leakage currents (compensating currents) can occur here that may cause random restarts, malfunctions or even the destruction of the device or peripheral devices.

If you want to connect devices fed by other power sources to the DLT-V8315 (e.g. printers), be sure to power up the peripheral devices at the same time or after the DLT-V8315; otherwise, you may encounter start-up problems or malfunctions and there may even be irreparable damage to the device.

15. Attaching the cable cover

Before commissioning the DLT-V83, the associated cable cover must be attached. The protection class of the DLT-V83 is only ensured if the cable cover is properly installed.



CAUTION

Risk of injury due to sharp-edged parts on the device.

The strain relief rail of the DLT-V83 can have sharp edges and cause cutting injuries.

⇒ Do not hold the DLT-V83 by the strain relief rail.

NOTICE: Property damage

Device not sealed properly due to incorrect attachment of the cables and the cable cover.

The protection class of the DLT-V83 is only ensured if the cable cover is properly installed. Improper installation can result in liquid penetrating into the DLT-V83 during operation. There is then a risk of short-circuiting, corrosion and wear.

15.1. Overview of mounting steps

- All cables that are connected to the DLT-V83 must be fit with the right cable grommets and inserted in the cable outlets of the strain relief rail.
- The cables are secured to the strain relief rail with cable clips. This prevents the cables from being loosened at the connection points when too much force is exerted (e.g. during scanning).
- Unused cable entry holes for the strain relief rail must be closed off with dummy grommets.
- The Advantech cable cover must then be secured to the DLT-V83.

15.2. Required components

- Cable cover of the DLT-V83 (optional with integrated UPS battery packs)



Fig. 15.1: Cable cover with integrated UPS battery (optional)

- 4 fastening screws (cylinder head screws ISO 4762-M4x10-A2)
- Cable clips and mounting screws (cylinder head screws ISO 4762-M3x12-A2)
- Cable sealing set consisting of dummy grommets and gradually widened cable grommets (3.5 mm to 8.0 mm; in 0.5 mm ascending increments)

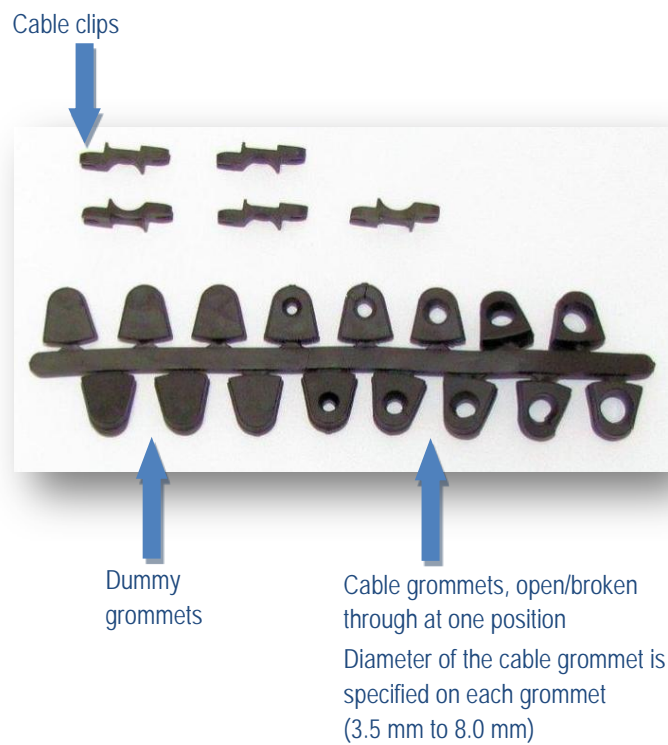


Fig. 15.2: Dummy grommets and cable grommets for various cable diameters

15.3. Attaching cable grommets and fixing strain relief in place

Important preparatory work

1. Checking the cable diameters and elasticity.

- ⇒ Check the cable diameters and elasticity of all the cables to be connected.
- ⇒ A cable grommet suitable for the diameter and elasticity of the cable must be used.
- ⇒ Bear the following points in mind when selecting a cable grommet:
 - The grommet must completely surround the cable.
 - The opening of the grommet must be slightly smaller than the cable diameter.

NOTICE: If a grommet is used that is too large or too small, the device will not be properly sealed.

2. Preparing the required cable grommets and dummy grommets.

- ⇒ Remove the required cable grommets and dummy grommets from the cable sealing set (using scissors, for example).
- ⇒ Cut the grommets off as cleanly as possible at the separation point so that they fit into the cable openings and seal them tightly.
- ⇒ Cable grommets and dummy grommets should be cut off as cleanly as possible. This is important in order to seal the Industrial Computer well.

Correct:



Incorrect:



Figure 3: Cable grommets and dummy grommets

Further procedure:

- ⇒ Connect the appropriate cable grommets to all cables that will be connected to the DLT-V83.



Fig. 15.4: Example cable grommet

- ⇒ Insert all cables into the DLT-V83 connection points.
- ⇒ Insert the cable grommets and cables into the outlets of the strain relief rail.

Tips for running the cables:

Try to make a small bend (a loop) when laying the cables. This supports the strain relief and prevents the cables from being loosened at the connection points when too much force is exerted.

Exception:

The power supply cable is relatively stiff and should be straight (see figure).

- ⇒ Try to lay all cables parallel to each other without crossing each other.

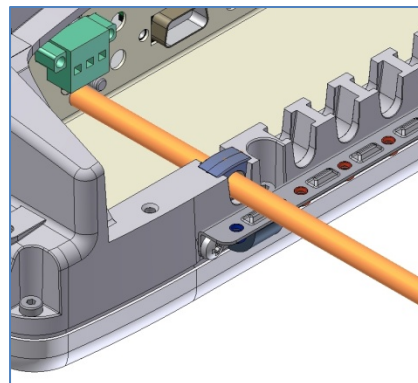


Fig. 15.5: The power supply cable, fit with a cable grommet, in the strain relief rail

- ⇒ Close off the unused cable outlets with dummy grommets.

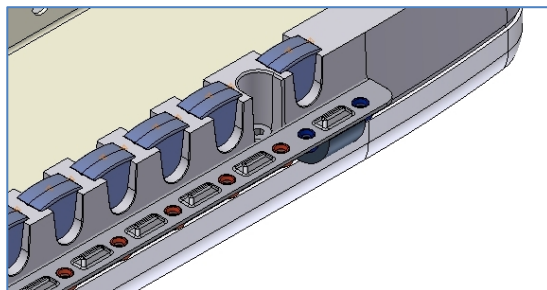


Fig. 15.6: Unused cable outlets sealed off

- ⇒ Secure all cables with cable clips and cylinder head screws ISO 4762-M3x12-A2 to the strain relief rail .

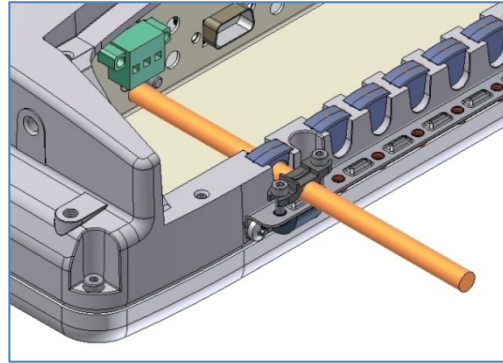


Fig. 15.7: Power supply cable with cable clip on the strain relief rail

NOTICE:

- ⇒ Tighten the screws to secure the cable but do not squeeze or crimp the cable! This may cause the cable to break or damage the cable insulation.

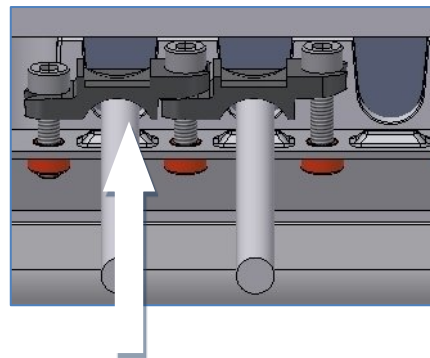


Fig. 15.8: Detailed view cable clips on strain relief rail

TIP (see detail figure):

The holes for the screws are located to the left and right at different heights depending on how the cable clips are rotated or placed. This gives you the option of securing two cable clips located next to each other with a single screw.

Example: Cables are fixed, dummy grommets are positioned

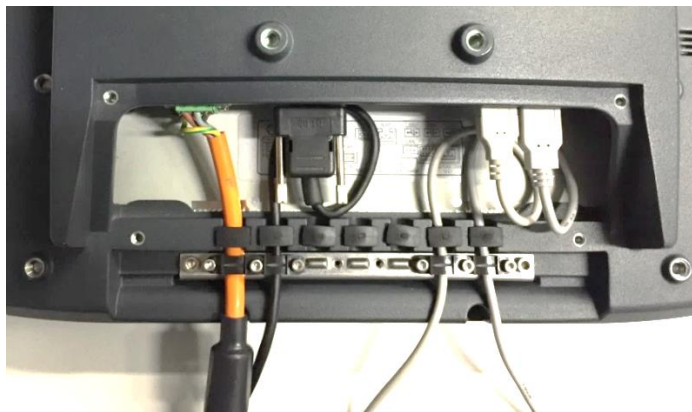


Fig. 15.9: Cables and dummy grommets

15.3.1. Attaching the cable cover (without integrated UPS)

- ⇒ Carefully mount all cables, see *Section 15.3. Attaching cable grommets and fixing strain relief in place.*
- ⇒ Place the cable cover in the DLT-V83 housing slot.
- ⇒ Loosely tighten the 4 cylinder head screws ISO 4762-M4x10-A2 of the cable cover.
- ⇒ Then fully tighten the screws with 3 Nm torque crosswise.

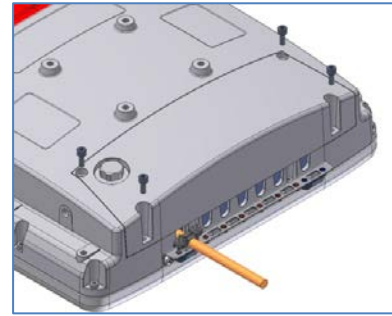


Fig. 15.10: Screwing the cable cover into place

15.3.2. Attaching the cable cover (with integrated UPS)



WARNING

Hazardous voltage, electric shock from contact with live parts.

Before connecting and disconnecting the cable cover with UPS, the DLT-V83 must be currentless.

- ⇒ Shut down the DLT-V83 properly.
- ⇒ Disconnect the main power supply cable from the power supply.
- ⇒ If the DLoG Config configuration was set to also start the DLT-V83 without the <Power> button and ignition, this setting must first be changed. Otherwise, the DLT-V83 will automatically restart after a short pause.

- ⇒ Carefully mount all cables, see *Section 15.3. Attaching cable grommets and fixing strain relief in place.*
- ⇒ Hold the cable cover to the bottom edge of the DLT-V83 as shown in the illustration. The connecting cables of the UPS must point in the direction of the connector panel.
- ⇒ Insert the plug with the detent lug, correctly oriented, into the connector panel socket marked **UPS optional**.

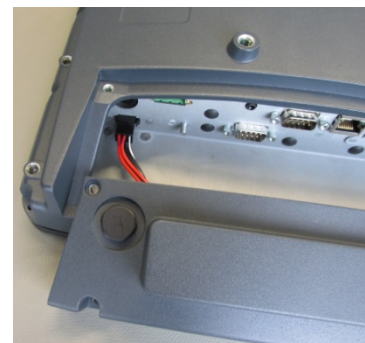


Fig. 15.11: Cable cover with integrated UPS battery

- ⇒ Place the cable cover into the housing groove of the DLT-V83.
- ⇒ Make sure that the battery cable is not jammed.
- ⇒ Loosely tighten the cylinder head screws ISO 4762-M4x10-A2 of the cable cover.
- ⇒ Then fully tighten the screws with 3 Nm torque crosswise.

15.4. Pressure compensation element

The DLT-V83 cable cover has a pressure compensation element.

- ⇒ Do not modify or remove the pressure compensation element; doing so would make the device leak and the IP protection would no longer be ensured.



Fig. 15.12: Pressure compensation element - Do not modify or remove!

16. Optional equipment/accessories

16.1. Integrated UPS (optional)

DLT-V83 Industrial Computers are optionally available with an integrated Uninterruptible Power Supply (UPS). The lithium-ion battery packs of the UPS are located in the cable cover of the DLT-V83.



Fig. 16.1: Cable cover with integrated battery packs for the UPS



WARNING

Personal injury from battery packs: Short-circuit, fire, chemical burns, toxic substances.

The integrated UPS battery packs in the cable cover of the DLT-V83 can ignite if handled improperly (risk of fire), cause chemical burns or release toxic substances.

- ⇒ Handle the cable cover carefully.
- ⇒ Do not allow water or other liquids to come into contact with the device (exercise particular caution with corrosive liquids).
- ⇒ Ensure that no liquids or foreign bodies get into the cable cover.
- ⇒ Provide sufficient ventilation.
- ⇒ Do not allow the device to come into contact with fire or operate it close to sources of heat or fire, open flame or heaters.
- ⇒ Observe the specific IP protection class.
- ⇒ Only use the DLT-V83 within the permitted temperature and humidity range.
- ⇒ Do not subject it to strong impacts and vibrations that exceed what is specified by the class 5M3/5M2 (DIN EN 60721-3-5).

16.1.1. UPS Battery pack specification

Integrated UPS technical data	
Bridging time	The integrated UPS can bridge an interruption of the main supply typically for 10 minutes. Requirement: the UPS is fully charged.
Operating temperature	-10 to +50 °C
Relative humidity	10% to 90% at 40 °C relative humidity, noncondensing
Mechanical vibration and shock resistance	<p>DLT-V8310 and DLT-V8312:</p> <ul style="list-style-type: none"> - Class 5M3 according to EN 60721-3-5 - US Highway Truck according to MIL-STD 810F <p>DLT-V8315:</p> <ul style="list-style-type: none"> - Class 5M2 according to EN 60721-3-5 - US Highway Truck according to MIL-STD 810F
Charging time	2.5 h (fully recharge a completely discharged battery). The 10 minutes bridging time becomes available again after a charge time of approx. 60 minutes. The UPS is automatically recharged when the main supply voltage is applied.
Charging temperature	0 to +45 °C (internal device temperature)
Storage temperature	-20 to +60 °C
Maximum output power	35 W
Input voltage	12 V
Output voltage	Typically 12 V
Battery voltage	7.2 V
Battery capacity	Devices manufactured until calendar week 2 /2018: 2200 mAh
	Devices manufactured since calendar week 3 /2018 and battery packs for replacement shipped since calendar week 3 /2018: 2000 mAh For your information: Find calendar week and manufacturing year on the device type plate next to abbreviation "Mfd".

16.1.2. Charging the integrated UPS correctly

To charge the battery packs of the integrated UPS:

- ⇒ Connect the properly installed DLT-V83 to the main supply voltage.
NOTICE: The cable cover of the DLT-V83 must be screwed together properly; the device must be fully closed.
Charging time: 2.5 hours (fully recharge a completely discharged battery).
- ⇒ Do not remove the battery packs from the cable cover; do not charge with external chargers.
- ⇒ Do not connect damaged cable covers with battery packs to the DLT-V83; do not charge.
- ⇒ Battery packs become warm while charging; this is normal. However, if they become excessively hot, immediately disconnect the DLT-V83 from the power source.
- ⇒ Do not continue to use the DLT-V83 if you notice an unusual level of heat or an unusual smell during charging.
- ⇒ Provide for sufficient ventilation of the DLT-V83 when charging the battery packs.

16.1.3. No repair/replacement of the battery packs

If the battery packs are faulty, the entire cable cover, including the integrated battery packs, must be replaced.

16.2. Screen-Defroster (optional)

Some DLT-V83 device models are available optionally with a Screen-Defroster.

Functional description

As soon as the internal temperature of the DLT-V83 device falls below 0 °C, the Screen-Defroster is automatically activated and heats the front of the device.

The front of the device thus thaws more quickly when leaving cold stores, for example.

In terms of the ambient temperature, this means:

- The Screen-Defroster is typically activated at an ambient temperature of -5 to -15 °C.
This depends on how quickly the ambient temperature changes or how quickly the DLT-V83 cools.
- The Screen-Defroster is typically deactivated again when the ambient temperature rises up to +5 to +15 °C.

The Screen-Defroster has a heat output of approx. 20 watts.

NOTICE: Property damage

When using DLT-V83 devices with a Screen-Defroster and UPS:

- ⇒ Do not park or store vehicles on which DLT-V83 devices with a Screen-Defroster and an integrated UPS are installed in areas with ambient temperatures below 0 °C.
- ⇒ If vehicles on which DLT-V83 devices with a Screen-Defroster and an integrated UPS are installed are parked or stored for a significant length of time, disconnect the DLT-V83 from the vehicle battery.

16.3. Pre-converter and power cables (optional)

Available for all DLT-V83 devices with DC power supply unit:

- Preconverter
- DC power cable

Available for the DLT-V8315 with AC power supply unit:

- AC Power cables EU and US

16.4. Voice Kit (optional)

The optional Voice Kit of the DLT-V83 contains a handheld microphone including speaker and bracket.

The internal speaker of the DLT-V83 is automatically deactivated if the Voice Kit is connected.

The handheld microphone is connected to the Audio/Mic interface of the DLT-V83.

Please use only handsets from “OTTO Communications”. Please contact your Advantech sales representative if needed.



Fig. 16.2: Voice Kit microphone (optional)

Voice Kit configuration under MS-Windows

To configure the voice kit, use the Control Panel menu **Audio Settings**. In the expanded view, the internal speaker can be configured as well as the external handset speaker (**Expansion**) and the microphone.

With the **Mute** button it is possible to activate/deactivate the speaker and the microphone individually.

The option **Route Micro to Output** can be used for testing and sends the microphone signal directly to the speaker.

16.5. Terminal mountings (optional)

Examples:

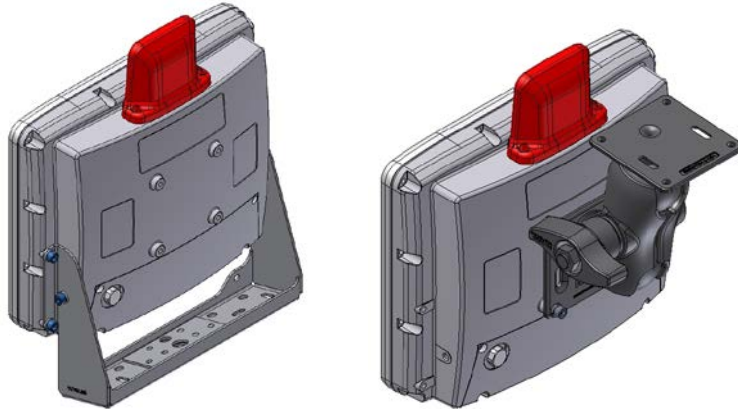


Fig. 16.3: Mounting bracket and RAM-Mount solution

16.6. Keyboards and keyboard holders (optional)



Fig. 16.4: SMALL keyboard and 24-key keypad

Keyboard-matching holders for secure mounting of the keyboards on the DLT-V83 are available.

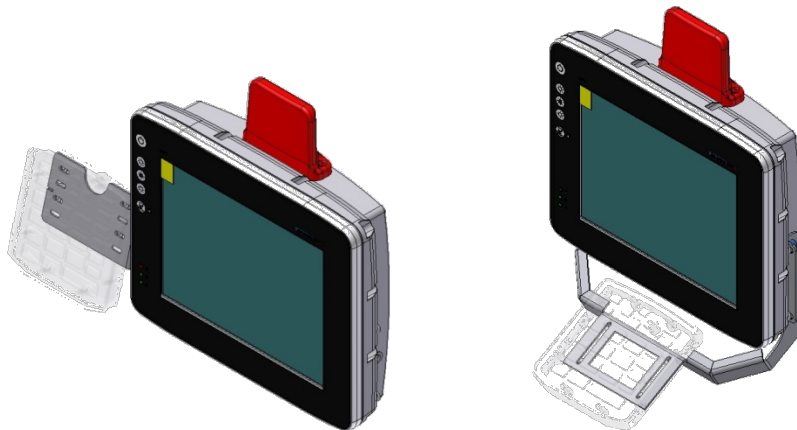


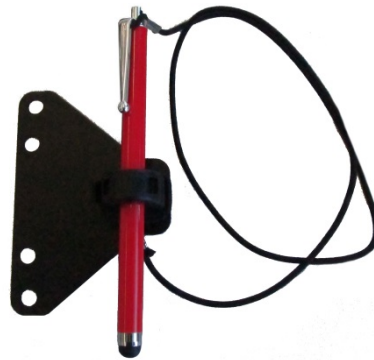
Fig. 16.5: Keyboard mounting holder examples

16.7. Stylus for touchscreens (optional)

Advantech offers touch stylus kits for resistive and PCT touchscreens.
Use only touch stylus kits that have been approved by Advantech.



Stylus with mounting
for resistive touchscreen



Stylus with mounting
for PCT touchscreen

Fig. 16.6: Stylus examples

16.8. External CD/DVD-ROM drive (optional)

An external CD/DVD-ROM drive can be connected to the DLT-V83 via the USB interface.
Please note: Not every device classified as a USB CD/DVD-ROM is a proper USB CD/DVD-ROM drive.

In the BIOS **USB CDROM** must be entered as a boot device.

The CD/DVD-ROM drive is bootable once it has been properly installed. To boot from a CD/DVD-ROM, insert a bootable CD/DVD and start the system.

NOTICE: Property damage

When connecting an external USB CD/DVD-ROM drive which has **its own external power supply** the DLT-V83 must be disconnected from the power supply.

The CD/DVD-ROM must be powered up **simultaneously** or **after** the DLT-V83 as otherwise this can cause start-up problems, malfunctions, or even the destruction of the device.

16.9. USB recovery stick (optional)

The optional Advantech recovery stick allows images to be backed up and restored onto the DLT-V83 when necessary (backup & recovery).

16.10. Scanner and scanner bracket (optional)

You can connect scanners to either the USB interface or the serial interface. If connected to COM1, the scanner can be powered through the interface with a voltage of 5 V or 12 V (option).

Use only scanners that have been approved by Advantech.

Optional scanner brackets are available for the DLT-V83.

16.11. Sun visor (optional)

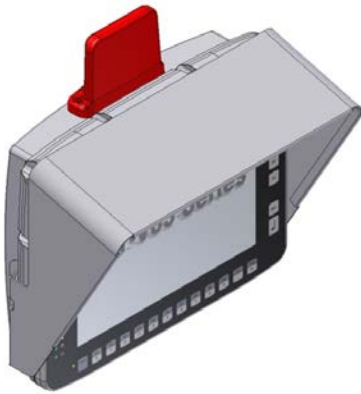


Fig. 16.7: DLT-V8312 with sun visor

Technical data	
Material	Aluminum, powder coated
Weight of sun visor DLT-V8310	300 g
Weight of sun visor DLT-V8312	357 g
Screws	DIN912 M6x10 A2 TufLok
Washers	DIN 1440-A6-A2
Tightening torque	10 Nm

16.12. Protective film for touchscreen (optional)

An optional protective film is available for resistive touchscreens. This film protects the touchscreen during extreme use.

17. Maintenance, Cleaning

17.1. Manufacturer, authorized service centers



WARNING

Only the manufacturer and its authorized service centers may perform:

- Repairs
- Modifications
- Replace modules
- Open the device

The legal warranty shall apply. It expires if the customer performs measures on the device that are only permitted to be performed by the manufacturer and its authorized Service Centers.

17.2. No repair/replacement of the battery packs

If the battery packs are faulty, the entire cable cover, including the integrated battery packs, must be replaced.

17.3. Regular checks and maintenance of the complete system

If the attachment of the DLT-V83 becomes loose and breaks during driving, this can lead to severe accidents.

To ensure the stability and security of the DLT-V83 complete system:

- ⇒ Regularly check whether the DLT-V83 is firmly seated in the associated holder (RAM mount, mounting bracket) and the mounting screws are not loose.
- ⇒ Also check whether the bracket is secured firmly to vehicle.
- ⇒ Check whether all connected cables are secured and the cable cover shuts tightly.
- ⇒ A regular inspection and maintenance of the entire system is necessary.

17.4. Cleaning the device



WARNING

Hazardous voltage, electric shock from contact with live parts when cleaning the device.

To prevent an electric shock:

- ⇒ Switch off the DLT-V83 before cleaning.
- ⇒ Disconnect from the power supply.
- ⇒ Disconnect connected accessories.

NOTICE: Property damage


Cleaning touchscreen and housing.

- ⇒ Never use chemical solvents to clean the touchscreen.
- ⇒ Do not use acidic or alkaline solutions.
- ⇒ Do not use cleaning agents that contain ammonia or sulfur (tile cleaners, for example, contain ammonia).
- ⇒ Do not use any abrasive glass cleaner or cloths that could scratch the touchscreen.
- ⇒ Do not use compressed air, a high-pressure cleaner or vacuum cleaner, as this can damage the surface.
Using a high-pressure cleaner poses the additional risk of water entering the device and damaging the electronics or display.

17.4.1. Cleaning the housing

- ⇒ Ensure that the device is switched off and currentless.
- ⇒ Clean the housing with a damp cloth.

17.4.2. Cleaning the touchscreen

- ⇒ Device with PCT touchscreen: Switch off the device completely.
- ⇒ Device with resistive touchscreen: Deactivate the touchscreen: 
- ⇒ Use a neutral glass cleaner (without ammonia, without isopropyl alcohol) applied to a lint-free cloth.
- ⇒ **NOTICE:** Do not apply cleaning agent to the touchscreen; apply it to the cleaning cloth.
- ⇒ Then wipe off the touchscreen with it.
- ⇒ Then use distilled water to remove any residual cleaner.

17.5. Touchscreen protective film (optional)

NOTICE: Property damage

Do not attach the protective film to damaged or worn out touchscreens. Air bubbles can get trapped and cause malfunctions.

The ordered optional protective film is normally attached to the DLT-V83 touchscreen at the factory.

If the film must be attached by the customer or replaced:

- ⇒ Turn off the DLT-V83.
- ⇒ Use a neutral glass cleaner without ammonia or isopropyl alcohol applied to a lint-free cloth.
- ⇒ Wipe off the touchscreen with it.
- ⇒ Then use distilled water to remove any residual glass cleaner.

NOTICE: Property damage

Never use any kind of chemical solvent, acidic or alkali solution.

Do not use any abrasive glass cleaner or cloths that could scratch the touchscreen.

- ⇒ Make sure that the surface of the touchscreen is free of dust and other particles.
- ⇒ Position the protective film with the adhesive side facing downwards tight at one corner of the viewing window.
- ⇒ Carefully press on the foil.
- ⇒ Then using a wiper (wooden wiper) to push out any air bubbles to the corners.

18. Malfunctions

Error	Possible cause(s)	Remedy
Device does not boot		Are all plug connections connected correctly? Is the <Power> button / Ign configuration correct? Correct voltage ranges present?
Mouse pointer position and touchscreen touch position do not match		If the deviation is large, recalibrate the touchscreen.
AC devices: signal transmission problems with connected devices		External electrical isolation of the relevant lines recommended.
Battery pack run time is significantly shorter than specified.	The device may possibly not be in the temperature range which is necessary for charging the battery pack.	Check the temperature specifications for the device and surroundings.
	Maximum number of charging cycles of the battery pack has been reached.	If temperature causes can be ruled out, the battery pack has possibly reached the maximum number of charging cycles. Replace the battery pack. Use only original battery pack from Advantech.
No UPS functionality although battery pack is plugged in.	Battery pack is discharged or deep discharged.	Charge the battery pack properly. Observe: If the battery pack is deep discharged, the charging time can increase by a multiple.
Nothing is shown on the display, Power LED does not light up.	There is no voltage present on the device.	Check the power switch, plug connection, power supply cable and fuse.
	Ignition signal missing.	Check ignition cable and signal
Nothing is shown on the display, Power LED active.	Backlight is switched off.	Press backlight key ("light bulb" symbol).
	Brightness to low	Increase display brightness with key
Nothing is shown on the display, Temp LED active.	Operating temperature limits exceeded/undershot .	Wait until the device has cooled down resp. warmed up.
Touchscreen reacts imprecisely. Device cannot be operated by touch input	Touchscreen is switched off.	Press touchscreen on/off.
	Touch driver error	Reinstall the touch driver or change settings
	Touchscreen is not calibrated correctly.	The touchscreens is already calibrated at the factory and therefore and does usually not need to be recalibrated.

		<p>However, the operating systems MS Windows 7 Pro, Windows 8.1 Industry and WE8S do permit recalibration of the touchscreen via software (Menu Control Panel -> Tablet PC Settings).</p> <p>This resets the sensitivity of the touchscreen to an operating system default setting, which can result in poorer detection of taps on the screen.</p> <p>You can use Reset to reset the software recalibration.</p>
Operating system does not start	External boot media lock	Remove all external storage
	Operating system damage	Operating system or image must be reinstalled
Software keyboard not functioning	License missing or invalid	Enter the correct software license
No WLAN connection	Connection deactivated	Activate connection in the Control Panel
	AP access problem	List ACL and check access rights to AP
	Invalid network settings	Check WLAN, authorization parameters, network and protocol settings
	Signal strength too weak	Check signal strength and quality in software; if necessary, the network must be enlarged
The system loses settings after a restart	Write protection activated	Deactivate write protection or authorize changes in operating system
	Operating system damage	Operating system or image must be reinstalled
No network connection	Connection deactivated	Activate connection in the Control Panel
	Invalid network settings	Check network and protocol settings
	Network problems	Check status LEDs on RJ45 connection socket, plug connection and cable

19. Reasonably foreseeable misuse

19.1. General

- Observe the permissible environmental conditions
- Observe correct voltage ranges.

19.2. Mobile application on vehicles

- Ensure that supply lines are fused correctly.
- Read the labeling on the cable and connect the power supply cable with the correct polarity.
- Cut the power supply cable as short as possible. This avoids tangled cables and improves the quality of the power supply.
- Observe the vehicle manufacturer's instructions for connecting additional loads, for instance, in conjunction with an emergency shut-off switch.
- Be sure that the connection of the line is as directly as possible to the battery and not to power supply lines with a great deal of interference (e.g. the engine power supply) or otherwise affected by consumers.
- Connect the power supply cable to a suitable place. Ensure that the connecting cable has an adequate cross section and ampacity at the connection point.

19.3. Stationary use with AC power supply unit

Please observe that the switch of the Advantech power supply cable must be set to **On** in order to be able to start the DLT-V83.

20. Guidelines and certificates

20.1. Simplified EU declaration of conformity

The manufacturer:

Advantech Co., Ltd.

NO.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114, Taiwan (R.O.C.)

Authorized representative in Europe:

Advantech Europe B.V.

Science Park Eindhoven 5708, 5692 ER Son, Netherlands

Hereby declares that the following products

Product name: Industrial Computer

Model name: DLT-V83xx

Comply with the provisions of the applicable EU directives, including their amendments applicable at the time of the declaration. For getting the detailed declarations of conformity please visit www.advantech.com or www.advantech.eu and contact your regional person in charge.

20.2. Low-voltage guidelines

DLT-V83 devices were tested and fulfill the IEC60950-1.

20.3. EMC guidelines

20.3.1. Shielded components

All components connected to the DLT-V83, as well as cable connections must also meet the legal EMC requirements for compliance with the EMC legislation. For this reason, screened bus, LAN cables and connectors must be used.

20.3.2. EMC EU

DLT-V83 devices fulfill the requirements of the EU Directive "2014/30/EU Electromagnetic Compatibility".

20.3.3. FCC USA

Original wording of the Federal Communications Commission

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 or more 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.



CAUTION

Radio frequency exposure.

In order to comply with the FCC requirements regarding radio frequency exposure from vehicle-mounted transmission devices:

- ⇒ The antenna has to be kept at least 20 cm away from people.

Any change or modification which is not expressly approved in the corresponding pages can lead to the withdrawal of the operating license for this device.

FCC ID

Please find the FCC ID on the device labels.

20.3.4. ICES Canada

English:	This Class A digital apparatus complies with Canadian ICES-003.
Français [French]:	Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

IC ID

Please find the IC ID on the device labels.

20.4. RoHS Directive EU

We hereby confirm the conformity of our products compliant with the RoHS Directive 2011/65/EU of the European Parliament and Council of June 8, 2011 on the restriction of the use of hazardous substances in electrical and electronic equipment.

20.5. RED (Radio Equipment Directive) 2014/53/EU

With regard to the RED (Radio Equipment Directive) 2014/53/EU the statements in the declaration of conformity for the DLT-V83 Industrial Computer apply.

Česky [Czech]:	Toto zařízení je v souladu se základními požadavky a ostatními odpovídajícími ustanoveními Směrnice 2014/53/EU.
Dansk [Danish]:	Dette udstyr er i overensstemmelse med de væsentlige krav og andre relevante bestemmelser i Direktiv 2014/53/EU.
Deutsch [German]:	Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 2014/53/EU.
Eesti [Estonian]:	See seade vastab direktiivi 2014/53/EU (EÜ) olulistele nõuetele ja teistele asjakohastele sätetele.
English:	This equipment is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.
Español [Spanish]:	Este equipo cumple con los requisitos esenciales así como con otras disposiciones de la Directiva 2014/53/EU (CE).
Ελληνική [Greek]:	Αυτός ο εξοπλισμός είναι σε συμμόρφωση με τις ουσιώδεις απαιτήσεις και άλλες σχετικές διατάξεις της Οδηγίας 2014/53/EU.
Français [French]:	Cet appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la Directive 2014/53/EU.
Íslenska [Icelandic]:	Þetta tæki er samkvæmt grunnkröfum og öðrum viðeigandi ákvæðum Tilskipunar 2014/53/EU.
Italiano [Italian]:	Questo apparato é conforme ai requisiti essenziali ed agli altri principi sanciti dalla Direttiva 2014/53/EU (CE).
Latviski [Latvian]:	Šī iekārta atbilst Direktīvas 2014/53/EU (EK) būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]:	Šis įrenginys tenkina 2014/53/EU (EB) Direktyvos esminius reikalavimus ir kitas šios direktyvos nuostatas.
Nederlands [Dutch]:	Dit apparaat voldoet aan de essentiële eisen en andere van toepassing zijnde bepalingen van de Richtlijn 2014/53/EU.
Malti [Maltese]:	Dan l-apparat huwa konformi mal-ftiġiet essenzjali u l-provedimenti l-oħra rilevanti tad-Direttiva 2014/53/EU.
Magyar [Hungarian]:	Ez a készülék teljesíti az alapvető követelményeket és más 2014/53/EU (EK) irányelvben meghatározott vonatkozó rendelkezéseket.
Norsk Norwegian]:	Dette utstyret er i samsvar med de grunnleggende krav og andre relevante bestemmelser i EU-direktiv 2014/53/EU (EF).
Polski [Polish]:	Urządzenie jest zgodne z ogólnymi wymaganiami oraz szczególnymi warunkami określonymi Dyrektywą UE: 2014/53/EU.
Português [Portuguese]:	Este equipamento está em conformidade com os requisitos essenciais e outras provisões relevantes da Directiva 2014/53/EU.
Slovensko [Slovenian]:	Ta naprava je skladna z bistvenimi zahtevami in ostalimi relevantnimi pogoji Direktive 2014/53/EU.
Slovensky [Slovak]:	Toto zariadenie je v zhode so základnými požiadavkami a inými príslušnými nariadeniami direktív: 2014/53/EU.
Suomi [Finnish]:	Tämä laite täyttää direktiivin 2014/53/EU (EY) olennaiset vaatimukset ja on siinä asetettujen muiden laitetta koskevien määräysten mukainen.
Svenska [Swedish]:	Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i Direktiv 2014/53/EU.

WLAN special regulations for Germany and France

For the DLT-V83 with WLAN 802.11a/b/g/n, the following restrictions apply:

- In Germany, WLAN 5 GHz band: 5.15 GHz – 5.35 GHz may only be used indoors.
- In France, WLAN operation outdoors is only permitted in the 2454 – 2483.5 MHz range at max. 10 mW EIRP.

20.6. Eco-design directive (2009/125/EC)

DLT-V83 Industrial Computers with an AC power supply unit meet the requirements of the Eco-design directive (2009/125/EC), which prescribes environmentally friendly design for products involved in energy consumption.

20.7. CE marking

The devices of the DLT-V83 series were tested and fulfill the CE conformity requirements and carry the CE mark on the rear side of the device.

20.8. CCC, SRRC China

Several DLT-V83 models are CCC- and SRRC-certified and carry the respective mark on the device label.

NOTICE

声明：此为A级产品，在生活环境中，该产品可能会造成无线电干扰，在这种情况下，可能需要用户对其干扰采取切实可行的措施。

20.9. CNROHS


Dear Customer,

Thanks for choosing an Advantech-DLoG Product, to comply with China Electronic Industry Standard SJ/T11364 which require Marking for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products, herein report to you product's environmental protection as follows.
Please disregard this notice if the product is not to be sold / installed in China.

品号 Model name	MTC6, XMT5, DLT-V83 and DLT-V72 series					
部件名称 Substance	产品中有害物质或元素的名称及含量 Name and concentration of hazardous substances contained in product					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
外壳	O	O	O	O	O	O
LED 显示屏	O	O	O	O	O	O
主板	X	O	O	O	O	O
塑胶件	O	O	O	O	O	O
线材	O	O	O	O	O	O
电源	X	O	O	O	O	O

O: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572标准规定的限量要求以下。
O: Represent the concentration for this hazardous substance in all homogeneous materials of the part Comply with the limit of the standard of GB/T 26572 . X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572标准规定的限量要求。 X: Represent the concentration for this hazardous substance at least in one homogeneous material of this part exceeds the limit of the standard of GB/T 26572. 企业说明:(对于超出标准的部分)

Enterprise statements: (for those exceeding the standard)
填写的内容:
Content:
产品标签上的环保使用期限(Environmental Protection Use Period, EPUP)标识表示在此期间内,在正常操作条件下,产品中所含有害物质或成分不会发生泄漏和变异。因而此类产品的使用不会导致任何严重的环境污染、任何人身伤害或财产损失。同时,不应将此期间视为保修期或保证有效期。
The mark of EPUP(Environmental Protection Use Period) in product label means in this period, by the normal operation mode, the hazardous substances won't leak out and deviate, so the product use won't result in serious environmental pollution, human injury or property loss , meanwhile, please don't take this period as the warranty date. 标签上带有污染控制标志的产品是可以回收的,不应随意进行处理。
The products which attach with pollution control mark can be recycled, and should not be discarded at will.



CNROHS-A0

20.10. MIC Japan (previously TELEC)

In several DLT-V83 models, the PE15N PCI Express Mini Card from Laird is used. Laird has implemented the following MIC certifications for this:

- Article 2 Item 19, Category WW (2.4 GHz Channels 1 - 13)
- Article 2 Item 19-2, Category GZ (2.4 GHz Chanel 14)
- Article 2 Item 19-2, Category XW (5150-5250 W52 & 5250-5350 W53)
- Article 2 Item 19-2, Category YW (5470-5725 W56)

Source:

<http://www.lairdtech.com/Products/Embedded-Wireless-Solutions/Summit-WLAN-Radio-Modules/Device-Certification-Guide/#MIC>

21. Recycling information



Used DLT-V83 devices, battery packs and batteries that are no longer being used may not be disposed of in the regular residential or domestic waste; they must be taken to an official public collection point and handled by a disposal provider.

Please contact the responsible authorities in your country/region to find out about the applicable regulations for proper disposal, if necessary.

22. List of figures

Fig. 5.1: Dimensions DLT-V8310	17
Fig. 5.2: Dimensions DLT-V8312	18
Fig. 5.3: Dimensions DLT-V8315	19
Fig. 5.4: Internal speaker position	20
Fig. 5.5: DC power supply connector with connector detail view.....	21
Fig. 5.6: DC connection cable, original Advantech.....	23
Fig. 5.7: DC connection cable assignment - drawing	23
Fig. 5.8: AC power connector with detail view.....	24
Fig. 6.1: WLAN antenna IEEE 802.11 a/b/g/n and antenna module (optional).....	30
Fig. 6.2: WLAN antenna IEEE 802.11 a/b/g/n/ac and antenna module (optional).....	31
Fig. 6.3: WLAN, WWAN 3G antenna (optional).....	32
Fig. 6.4: DLT-V83 rear view with WLAN, WWAN, LTE 4G antenna (Multiband).....	33
Fig. 6.5: External WLAN antenna (optional).....	34
Fig. 6.6: External 3G WWAN antenna (optional).....	35
Fig. 6.7: External WWAN antenna (optional).....	36
Fig. 6.8: External GPS receiver (optional).....	38
Fig. 6.9: Ext. GPS receiver, display example during installation	38
Fig. 7.1: RJ45 network port	41
Fig. 7.2: CAN, Digital In/Out and second Ethernet interface	42
Fig. 7.3: Pin assignment of CAN interface.....	42
Fig. 7.4: Digital I/O interface pin position.....	43
Fig. 7.5: Optional RJ45 network socket of the DLT-V83	44
Fig. 7.6: DC device external connections with optional expansion interfaces	45
Fig. 7.7: AC device external connections with optional expansion interfaces.....	46
Fig. 7.8: Example of antenna, type 4 in 1	47
Fig. 7.9: Protective cap examples	47
Fig. 8.1: WLAN antenna unscrewed.....	49
Fig. 8.2: Open WLAN antenna IEEE 802.11 a/b/g/n/ac	50
Fig. 8.3: WLAN antenna IEEE 802.11 a/b/g/n/ac opened	50
Fig. 8.4: WLAN, WWAN 3G antenna	51
Fig. 8.5: WLAN, WWAN 3G antenna opened.....	51
Fig. 8.6: Open WLAN, WWAN antenna.....	52
Fig. 8.7: Open WLAN / WWAN antenna.....	52
Fig. 8.8: WLAN, WWAN antenna opened	52
Fig. 9.1: <Power> button	56
Fig. 9.2: Example: DLT-V8312 version with 26 front keys.....	58
Fig. 9.3: Example: Operating elements front side DLT-V8310 with PCT touchscreen	63
Fig. 9.4: Software keyboard example	65
Fig. 10.1: DLoG Config Tool main menu, example Win 10 IoT Enterprise.....	68
Fig. 10.2: Start of the IXXAT driver installation.....	70
Fig. 10.3: iManager: GPIO Bank Control.....	71
Fig. 10.4: Network Connection Properties, Advanced.....	73
Figure 10.5: iManager: Network Connection Properties, Power Management.....	73
Fig. 10.6: Network Connection Properties, Advanced.....	74
Figure 10.7: iManager: Network Connection Properties, Power Management.....	74
Fig. 10.8: Network Connection Properties, Advanced.....	74
Figure 11.1: System overview in Control Panel.....	79
Figure 11.2: Setup.exe for 64 bit operating system in the subfolder Win7_X64	80
Figure 11.3: Setup.exe for 64 bit operating systems Win8.1 / 10.....	81
Figure 11.4: IGX driver installation Welcome dialog.....	82
Figure 11.5: IGX driver installation user and company name.....	82
Figure 11.6: IGX driver installation All program features.....	83
Figure 11.7: IGX driver installation starts	83
Figure 11.8: IGX driver installation Windows Security.....	84
Figure 11.9: IGX driver installation Exit with Finish	84
Figure 11.10: IGX driver installation Perform computer re-start	85

Figure 11.11: WCU icon on the desktop.....	86
Figure 11.12: WCU main window, Admin Login	86
Figure 11.13: WCU-Administrator login window	87
Figure 11.14: Check License	88
Figure 11.15: Info display via existing license	88
Figure 11.16: Browse nearby wireless networks function.....	89
Figure 11.17: Advanced Security Settings dialog	90
Figure 11.18: Connection when the network is in range dialog	90
Figure 11.19: Security settings - network authentication methods	92
Figure 11.20: Security settings – Advanced settings (Cisco: Leap).....	93
Figure 11.21: Security settings – LEAP properties	93
Figure 11.22: Wireless Network properties dialog	94
Figure 11.23: Create new profile dialog.....	94
Figure 11.24: Network connection is established	95
Figure 11.25: General dialog in the Roam Management menu	96
Figure 11.26: Roaming dialog in the Roam Management menu	97
Figure 11.27: Roam Management – Choose Band and Channels	98
Figure 11.28: Radio dialog in the Roam Management menu	100
Figure 11.29: Adapter Tab in Roam Management menu.....	101
Fig. 11.30: Initial Laird Connection Manager dialog box.....	101
Fig. 11.31: LCM Configuration tab with the Manage Profiles button.....	102
Fig. 11.32: LCM Manage Profiles dialog box with the Admin Login tab.....	102
Fig. 11.33: Entering the LCM password: SUMMIT	102
Fig. 12.1: SIERRA WIRELESS MC80 - Device manager, Sierra Wireless HSPA Modem	106
Fig. 12.2: SIERRA WIRELESS MC80 - Sierra Wireless HSPA Modem - Properties.....	106
Fig. 12.3: SIERRA WIRELESS MC80 - Set up a new connection or network	106
Fig. 12.4: SIERRA WIRELESS MC80 - Connect to the Internet.....	107
Fig. 12.5: SIERRA WIRELESS MC80 - Connect to the Internet - Dial-up	107
Fig. 12.6: SIERRA WIRELESS MC80 - Telephone number and connection name.....	107
Fig. 12.7: SIERRA WIRELESS MC80 - Network connections - Vodafone test connection	108
Fig. 12.8: SIERRA WIRELESS MC80 – Dial test connection	108
Fig. 12.9: SIERRA WIRELESS MC80 - Function test GSM / GNSS, test connection status.....	108
Fig. 12.10: SIERRA WIRELESS MC80 - Virtual COM ports DLT-V83 with D525 processor.....	109
Fig. 12.11: SIERRA WIRELESS MC80 - Virtual COM ports DLT-V83 with i5 processor	110
Fig. 12.12: SIERRA WIRELESS MC80 - Virtual COM ports DLT-V83 with Celeron processor.....	110
Fig. 12.13: SIERRA WIRELESS MC80 - test NMEA data flows	111
Fig. 12.14: QUECTEL EC25 - Set up a new connection or network.....	112
Fig. 12.15: QUECTEL EC25 - Connect to the Internet	112
Fig. 12.16: QUECTEL EC25 - Connect to the Internet - Dial-up.....	113
Fig. 12.17: QUECTEL EC25 - Connect to the Internet - Telephone number	113
Fig. 12.18: QUECTEL EC25 - Network connections - Vodafone test connection.....	113
Fig. 12.19: QUECTEL EC25 - Dial Vodafone test connection	114
Fig. 12.20: QUECTEL EC25 - Function test GSM / GNSS, test connection status	114
Fig. 12.21: QUECTEL EC25 - Virtual COM ports DLT-V83 with i5 processor	115
Fig. 12.22: QUECTEL EC25 - Virtual COM ports DLT-V83 with Celeron processor	115
Fig. 12.23: QUECTEL EC25 - Test NMEA data flows	117
Fig. 13.1: Position of the VESA drill holes DLT-V8310.....	121
Fig. 13.2: Position of the VESA drill holes DLT-V8312.....	122
Fig. 13.3: Position of the VESA drill holes DLT-V8315.....	123
Fig. 14.1: DC connection cable with Phoenix contact connector	125
Fig. 14.2: Position of the ground bolt.....	126
Fig. 15.1: Cable cover with integrated UPS battery (optional).....	130
Fig. 15.2: Dummy grommets and cable grommets for various cable diameters	130
Figure 3: Cable grommets and dummy grommets	131
Fig. 15.4: Example cable grommet.....	132
Fig. 15.5: The power supply cable, fit with a cable grommet, in the strain relief rail	132
Fig. 15.6: Unused cable outlets sealed off.....	132

Fig. 15.7: Power supply cable with cable clip on the strain relief rail.....	133
Fig. 15.8: Detailed view cable clips on strain relief rail.....	133
Fig. 15.9: Cables and dummy grommets.....	133
Fig. 15.10: Screwing the cable cover into place.....	134
Fig. 15.11: Cable cover with integrated UPS battery.....	134
Fig. 15.12: Pressure compensation element - Do not modify or remove!.....	135
Fig. 16.1: Cable cover with integrated battery packs for the UPS.....	136
Fig. 16.2: Voice Kit microphone (optional).....	139
Fig. 16.3: Mounting bracket and RAM-Mount solution.....	140
Fig. 16.4: SMALL keyboard and 24-key keypad.....	140
Fig. 16.5: Keyboard mounting holder examples.....	140
Fig. 16.6: Stylus examples.....	141
Fig. 16.7: DLT-V8312 with sun visor.....	142