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Engineering, Commissioning	16		

SAFETY INFORMATION

General Safety Information

- ▶ When performing any work, all instructions given by the manufacturer and in particular the safety instructions provided in these Installation and Commissioning Instructions are to be observed. Make sure that the local standards and regulations are observed at all times.
- ▶ The CLIF-CBUSLC Interface and C-Bus controllers may be installed and mounted only by authorized and trained personnel.
- ▶ If the device housing is damaged or missing, immediately disconnect it from any power.
- ▶ If the device is broken or defective, do not attempt to repair it yourself; rather, return it to the manufacturer.
- ▶ It is recommended that devices be kept at room temperature for at least 24 hours before applying power. This is to allow any condensation resulting from low shipping / storage temperatures to evaporate.
- ▶ The CLIF-CBUSLC must be installed in such a manner (e.g., in a lockable cabinet) as to ensure that uncertified persons have no access to the terminals.
- ▶ In the case of vertical mounting on DIN rails, the CLIF-CBUSLC Interface should be secured in place using a commercially-available stopper.
- ▶ If the CLIF-CBUSLC is modified in any way, except by the manufacturer, all warranties concerning operation and safety are invalidated.
- ▶ Rules regarding electrostatic discharge should be followed.
- ▶ Use only accessory equipment which comes from or has been approved by Honeywell.

Information as per EN 60730

Purpose

The purpose of the device is: OPERATING CONTROL. The CLIF-CBUSLC is an interface device intended for HVAC in home (residential, commercial, and light-industrial) environments.

Construction

The CLIF-CBUSLC is an independently mounted electronic control unit with fixed wiring.

Mounting Method


The CLIF-CBUSLC is suitable for mounting as follows:

- ▶ in cabinets;
- ▶ in fuse boxes conforming with standard DIN43880, and having a slot height of max. 45 mm;
- ▶ on walls (using accessory MVC-80-AC1).

Table 1. Information as per EN 60730

Shock protection	Class II
Pollution degree	2
Installation	Class 3
Software class	Class A
Ball-pressure test temperature	housing parts >75 °C terminals >125 °C

WEEE Directive

WEEE: Waste Electrical and Electronic Equipment Directive	
	<ul style="list-style-type: none"> ▪ At the end of the product life, dispose of the packaging and product in an appropriate recycling center. ▪ Do not dispose of the device with the usual domestic refuse. ▪ Do not burn the device.

Standards, Approvals, etc.

Degree of Protection: IP20 (mounted on walls, with two accessory MVC-80-AC1 covers)
Refer to Code of Practice standards IEC 61000-5-1 and -2 for guidance.
The device complies with Ethernet Protocol versions IEEE 802.3.

RELATED TECHNICAL LITERATURE

Table 2. Related Technical Literature

Title	Product Literature no.
CLIF-CBUSLC – Product Data	EN0Z-1026GE51
CLIF-CBUSLC – Mounting Instructions	MU1Z-1026GE51
CentralLine NX C-Bus Driver – User Guide	EN2Z-1021GE51
IF-LON2 – Product Data & Mounting Instr.	MU1Z-0545GE51
EAGLEHAWK AX – General Security Best Practices	EN0Z-1017GE51
EAGLEHAWK NX – General Security Best Practices	EN0Z-1040GE51
CentralLine NX C-Bus Driver – User Guide	EN2Z-1021GE51
CentralLine NX LonSock RNI Driver – User Guide	EN2Z-1054GE51

SPECIFICATIONS

Table 3. CLIF-CBUSLC specifications

Power supply	19 ... 29 VAC, 50/60 Hz or 20 ... 30 VDC
Power consumption	typically dc: 5 W; max. 6 W typically ac: 9 VA; max. 11 VA
Current consumption	typically dc: 210 mA; max. 240 mA typically ac: 370 mA; max. 410 mA
Ambient temperature	0 ... 40 °C (wall-mounting)
Storage temperature	-20 ... +70 °C
Humidity	5 ... 95% r.h. non-condensing
Dimensions	See Fig. 12 and Fig. 13.
Degree of protection	IP20 (mounted on walls, with two accessory MVC-80-AC1 covers)
Fire class	V0
Weight	0.6 kg (excl. packaging)

SYSTEM OVERVIEW

Overview of Hardware

Table 4. Overview of hardware

feature	description	max. cable length	no.	
bus interfaces	RS485-1, isolated, C-Bus communication	1200 m	1	
	Ethernet Interface	e-mail communication, browser access	100 m	1
		SUSI IP communication	100 m	1
	USB 2.0 Device Interface (as Network Interface)	3 m	1	
	USB 2.0 Host Interface (max. 500 mA)	3 m	1	
LEDs	power LED (green)	--	1	
	status LED (red, controllable by firmware)	--	1	
	LED L1 (yellow) unused	--	1	
	LED L2 (yellow) indicating that a SUSI client (ARENA ^{AX} , COACH ^{AX} or ARENA 3.0) is connected	--	1	
	bus status LEDs (for isolated RS485-1 interface)	--	2	

System Scenarios

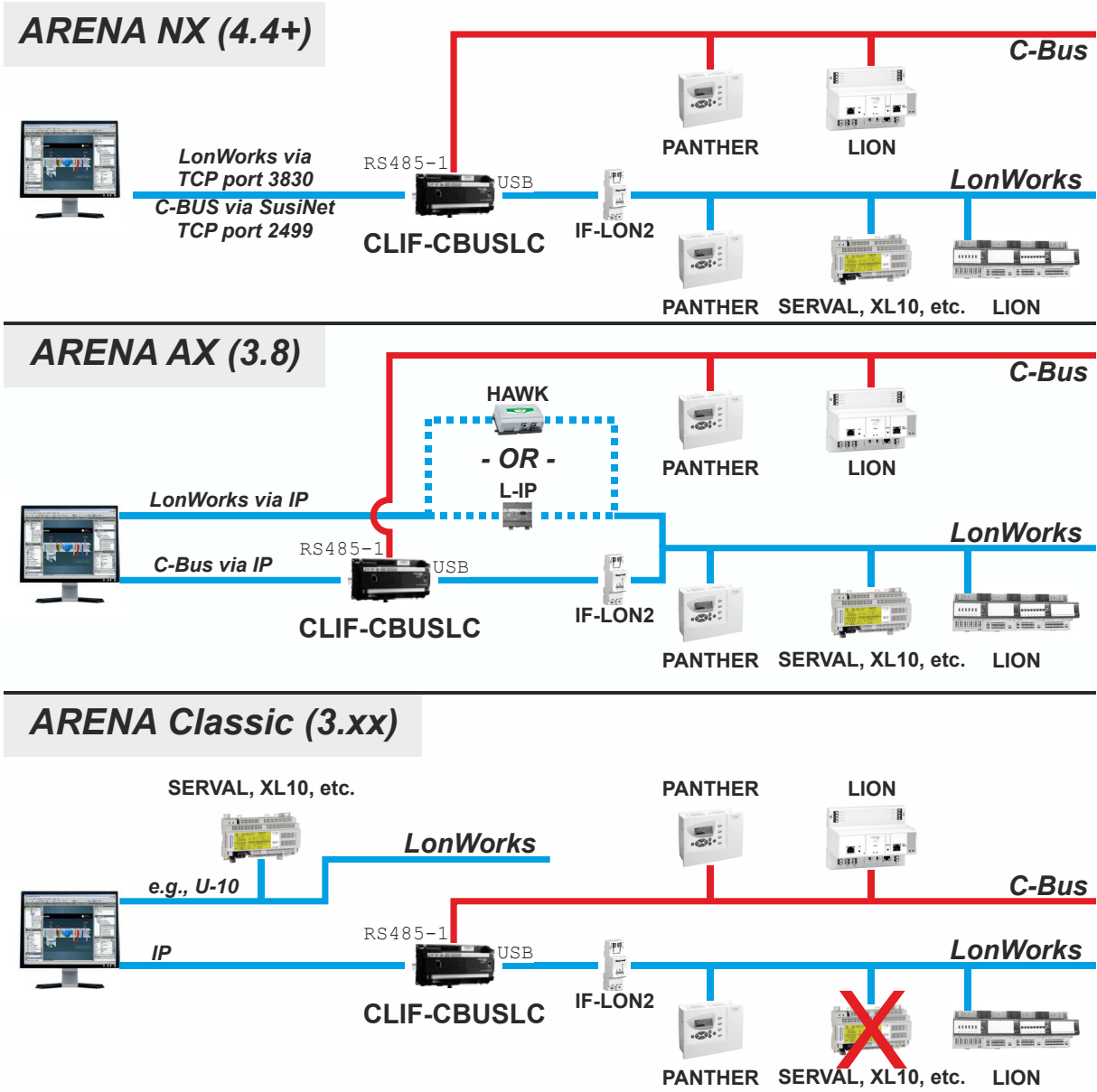


Fig. 1. System scenarios

Bus and Port Connections Overview

WARNING

Risk of electric shock or equipment damage!

- ▶ Do not touch any live parts in the cabinet!
- ▶ Disconnect the power supply before making connections to or removing connections from terminals of the CLIF-CBUSLC
- ▶ Do not reconnect the power supply until you have completed installation.
- ▶ It is prohibited to power the CLIF-CBUSLC with the same transformer used to power controllers or other devices (e.g., the PW M-Bus Adapter).
- ▶ Observe the rules regarding electrostatic discharge.

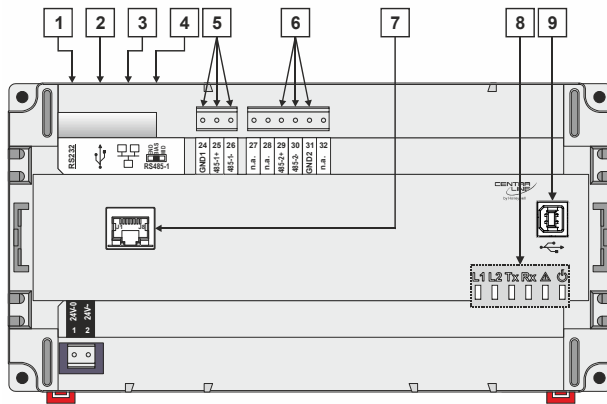


Fig. 2. Top view

Legend

- 1 RS232 / RJ45 socket (for factory debugging)
- 2 USB 2.0 Host Interface (for connection of the IF-LON2); max. 500 mA, high speed
- 3 Ethernet / RJ45 socket (for SUSI communication); 10/100 Mbit/s; 1 "link" LED and 1 "activity" LED
- 4 Three-position slide switch (for setting bias and termination resistance of RS485-1: MUST REMAIN IN MIDDLE POSITION!)
- 5 RS485-1 (isolated; for C-Bus communication)
- 6 RS485-2 (non-isolated; DO NOT USE)
- 7 Future functionality
- 8 LEDs
- 9 USB 2.0 Device Interface (for connection to web browser for setup)

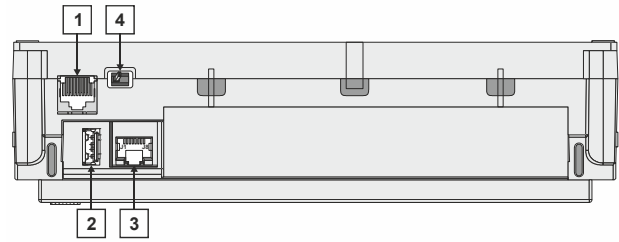


Fig. 3. Side view

WARNING

Risk of electric shock or equipment damage!

- ▶ It is prohibited to connect any of the RJ45 sockets of the CLIF-CBUSLC Interface to a so-called PoE-enabled device ("Power over Ethernet").

RS232 / RJ45 Socket

Via its RS232 / RJ45 socket, the CLIF-CBUSLC can be connected to a terminal for debugging purposes.

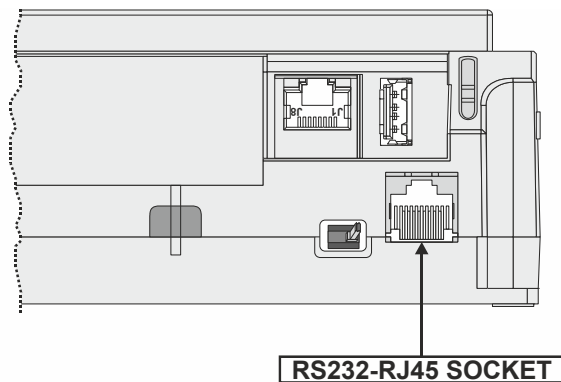


Fig. 4. RS232 / RJ45 socket

USB 2.0 Host Interface

Via its USB 2.0 Host interface, the CLIF-CBUSLC can be connected to the IF-LON2 External Interface Adapter and thus to LONWORKS networks. Max. 500 mA, high speed. See also section "LonWorks Communications" on pg. 19.

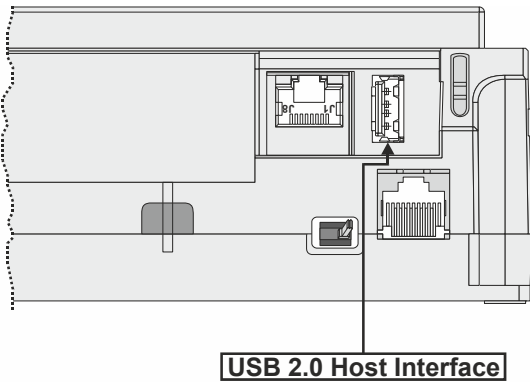


Fig. 5. USB 2.0 Host interface

USB 2.0 Device Interface

The CLIF-CBUSLC is equipped with a USB 2.0 Device Interface at the front. This interface is for connection to a web browser for setting up the device.

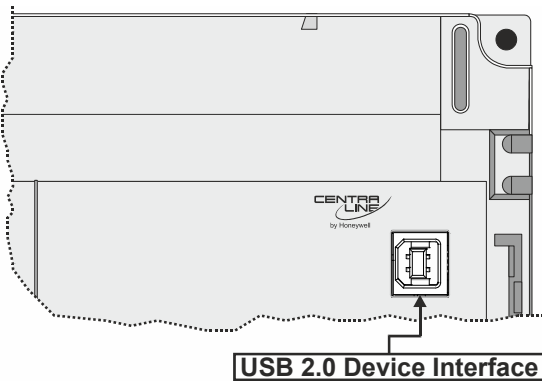


Fig. 6. USB 2.0 Device Interface

A standard USB type-B connector can be inserted into this USB 2.0 Device Interface.

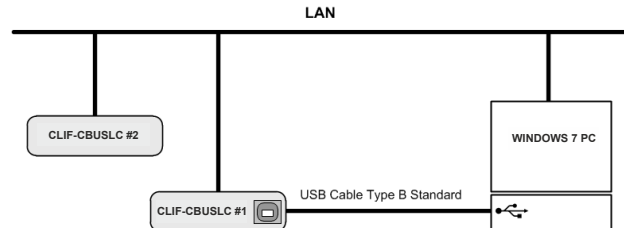
NOTE: Before attempting to connect a web browser to the USB 2.0 Device Interface of the CLIF-CBUSLC, you must first install the USB Driver on your PC. See following section "USB Driver Installation".

USB Driver Installation

Windows 7

In order to connect the CLIF-CBUSLC to the Windows 7 PC, you will need an USB cable of type A-Male-to-type-B-Male (Type B standard).

The CLIF-CBUSLC will be connected to the Windows 7 PC as shown in the following figure.



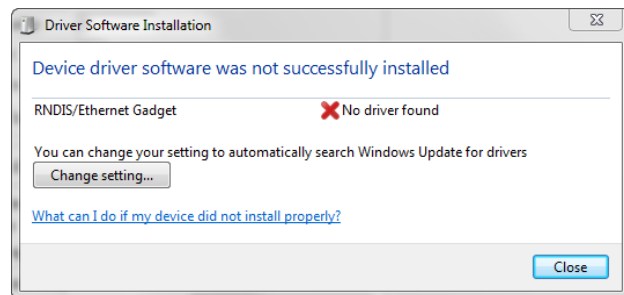
Driver Variants

Depending on the firmware version, there are two different ways to install the USB driver.

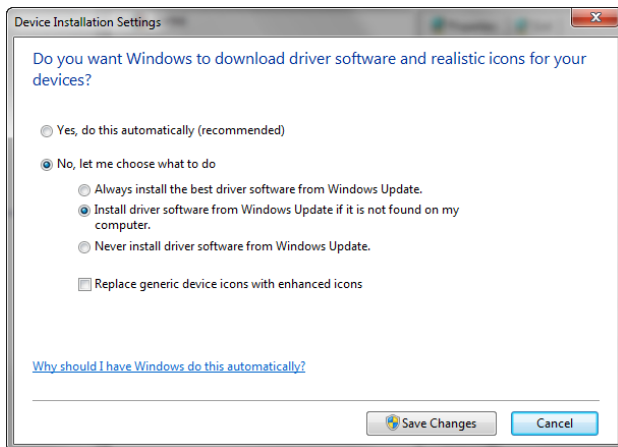
1. On most PCs, the update is done automatically with the Windows update function.
2. In the case of firmware 4.00.00 or higher, you can use the Microsoft driver from your Windows 7 installation (procedure then starts with step 17 of the following Procedure).

PROCEDURE

1. Insert the A Male connector of the USB cable into an USB interface jack of the PC and insert the B Male connector into the controller's USB device interface jack.
RESULT: The Found New Hardware Wizard is enabled in the Windows Task Line.
2. In the Windows Task Line, double-click the icon.
RESULT: The Driver Software Installation message box displays.

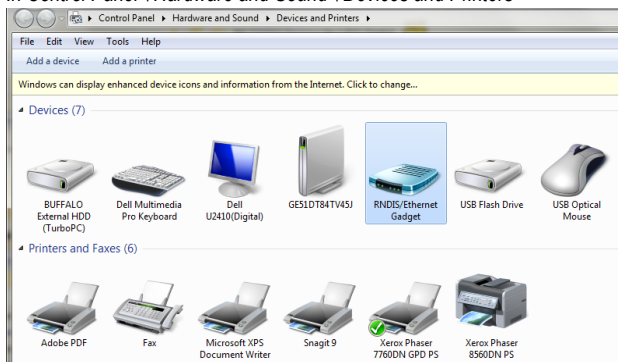


3. If no RNDIS/Ethernet Gadget driver was found as indicated by the message "X No driver found", click the **Change setting...** button.
RESULT: The Device Installation Settings dialog box displays.



4. Select **No, let me choose what to do**, and then select **Install driver software from Windows Update if it is not found on my computer**.
 5. Click the **Save Changes** button.
- RESULT:** Software tries to install the RNDIS / Ethernet Gadget driver. If the driver is successfully installed, it can be seen in the following locations within Windows (see figures below):

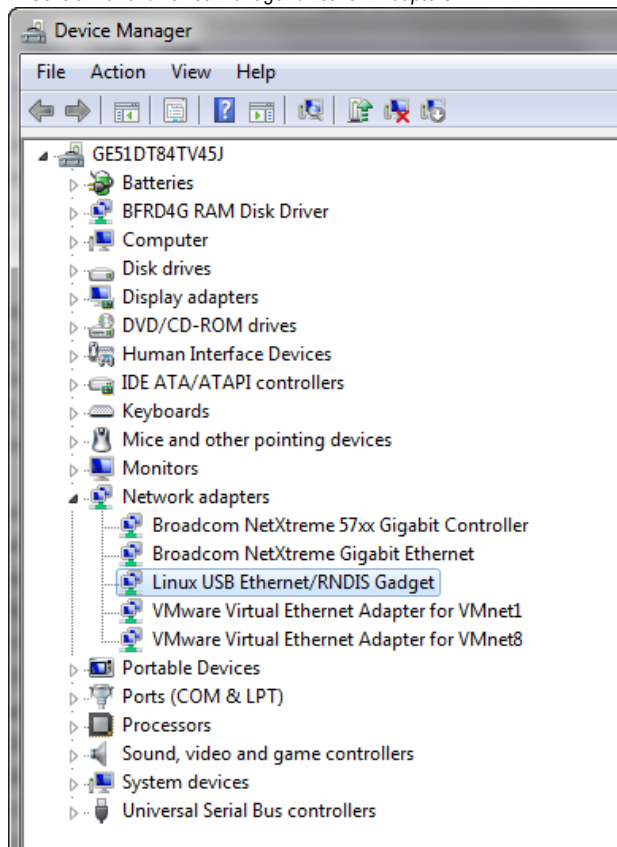
In Control Panel \ Hardware and Sound \ Devices and Printers



In Control Panel \ Network and Internet \ Network Connections

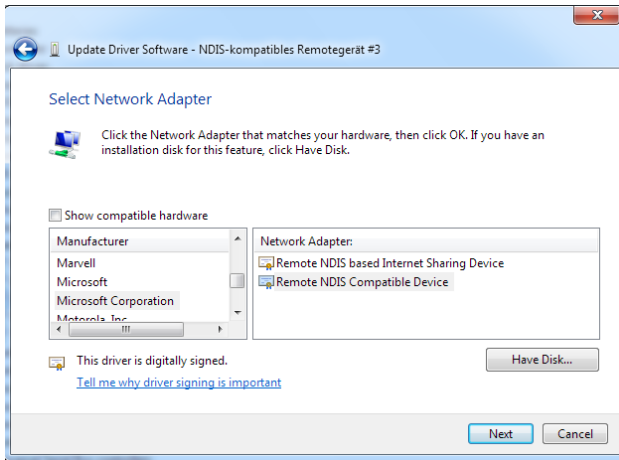


In Control Panel \ Device Manager \ Network Adapters



6. If the driver has still not been successfully installed, do the following:
7. Right-click on the driver in the **Network adapters** folder in the *Device Manager*, and then click **Update Driver Software**.
8. Click **Browse my computer for driver software**.
9. Click **Let me Pick from a list of device drivers on my computer**.
10. Click **Have Disk...**
11. Click **Browse...** and navigate to the folder <drive:>\CARE\drivers.
12. Depending on your Windows operating system type (32-bit or 64-bit), select the RNDIS USB driver (32-bit) or the RNDIS USB driver (64-bit) file, and then click **Open**.
13. Click **OK**.
14. Select **Linux USB Ethernet/RNDIS Gadget**, and then click **Next>**.
15. If a warning message displays, click **Continue Anyway**.
RESULT: Windows will install the driver.
16. Click **Close**.
17. Check the successful installation of the driver as described in step 5.
18. If this still does not work, use the driver shipped with Windows.
19. Right-click on the driver in the **Network adapters** folder in the *Device Manager*, and then click **Update Driver Software**.
20. Click **Browse my computer for driver software**.

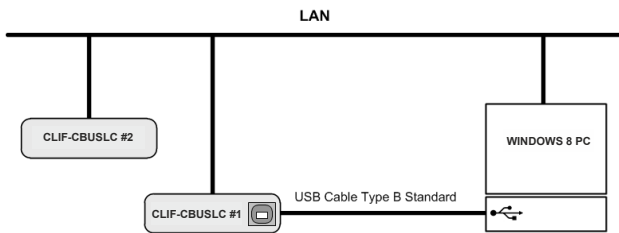
21. Click **Let me Pick from a list of device drivers on my computer**.
22. Uncheck the Show compatible hardware box.
23. Select the Manufacturer Microsoft Corporation
24. Select Remote NDIS Compatible Device



25. Check the successful installation of the driver as described in step 5.
26. If the device status is "This device cannot start. (Code 10)", reboot your PC.

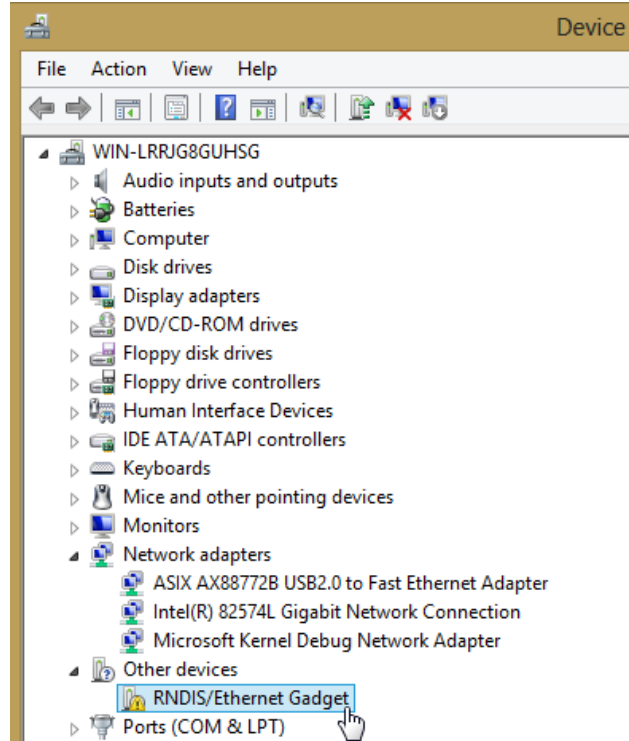
Windows 8

In order to connect the CLIF-CBUSLC to the Windows 8 PC, you will need an USB cable of type A-Male-to-type-B-Male (Type B standard). The CLIF-CBUSLC will be connected to the Windows 8 PC as shown in the following figure.

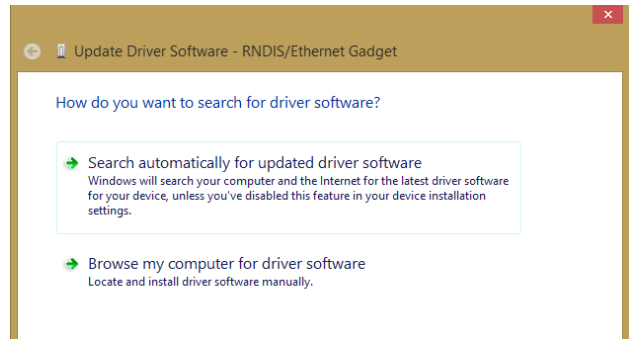


PROCEDURE

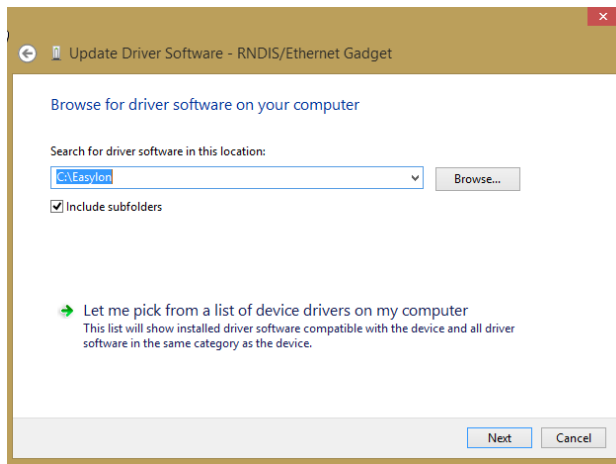
1. Insert the A Male connector of the USB cable into an USB interface jack of the PC and insert the B Male connector into the controller's USB device interface jack.
2. In Windows, start the device manager.



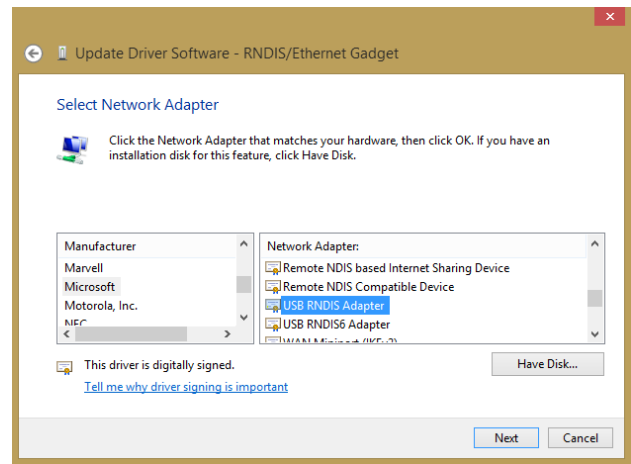
3. Click **Other devices**, then right-click **RNDIS/Ethernet Gadget** and then select **Update driver Software...**
RESULT: The Update Driver Software – RNDIS / Ethernet Gadget dialog displays.



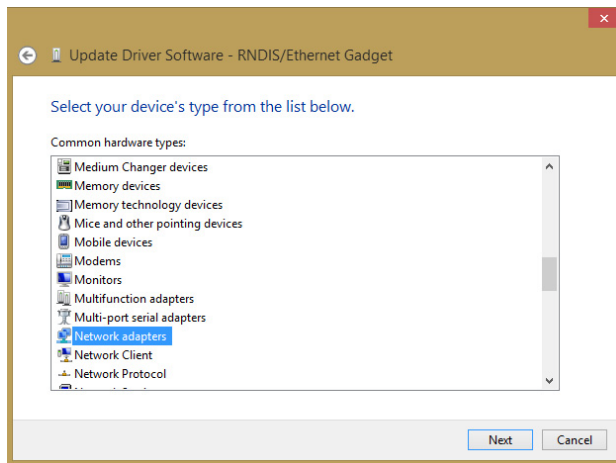
4. Click **Browse my computer for driver Software...**



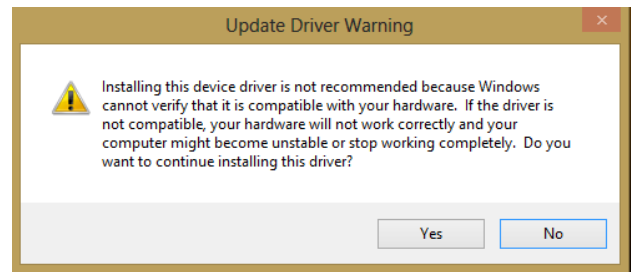
- Click **Let me pick from a list of device drivers on my computer**.



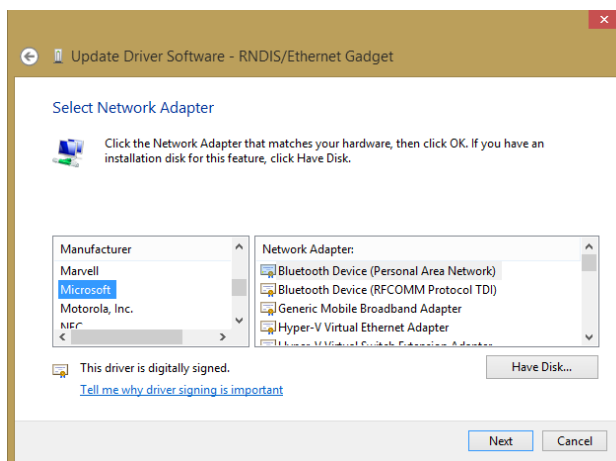
- Select **USB-RNDIS-Adapter**, and then click **Next** button.
RESULT: The Update Driver Warning message box displays.



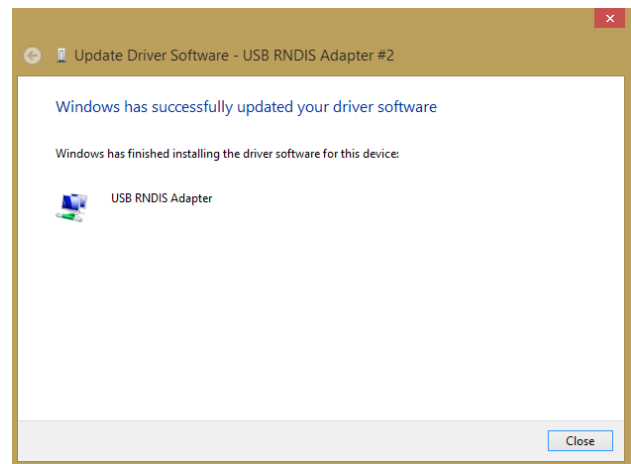
- Select **Network adapters**.



- Confirm the warning by clicking **Yes** button.
RESULT: The driver will be installed successfully as indicated by the final message box.



- Select **Microsoft**.



- Click the **Close** button.

Windows 10

In the case of controllers with firmware 4.00.00 or higher, the appropriate driver is automatically installed with a Windows update. In the case of controllers with firmware 3.04.05 or

lower, the automatic installation does not work: Please download the appropriate USB driver prior to the installation at:

<http://catalog.update.microsoft.com/v7/site/ScopedViewRedirect.aspx?updateid=37e35bd4-d788-4b83-9416-f78e439f90a2>

Please connect the controller to the PC as described in section "Windows 8" and perform the general installation procedures for drivers in Windows 10.

Ethernet / RJ45 Socket

The CLIF-CBUSLC is equipped with an Ethernet / RJ45 socket featuring one LED.

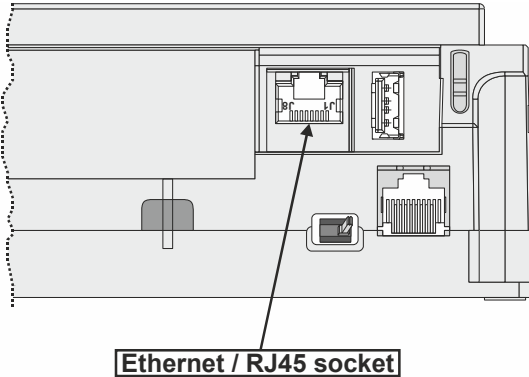


Fig. 7. Ethernet / RJ45 socket

This Ethernet / RJ45 socket is a 10/100-Mbaud Ethernet interface permitting communication with a SUSI client like ARENA^{AX}, ARENA^{NX}, COACH^{AX}, COACH^{NX}, or ARENA 3.0 (as per IEEE 802.3)

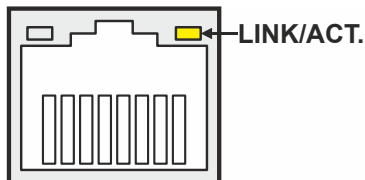


Fig. 8. Ethernet / RJ45 socket

NOTE: The Ethernet / RJ45 socket is usually earth-grounded. For additional information on earth grounding, see also "Appendix 1: Earth Grounding" on pg. 24.

LEDs

The CLIF-CBUSLC features the following LEDs:



Fig. 9. CLIF-CBUSLC LEDs

Table 5. CLIF-CBUSLC LEDs

symbol	color	function, description
L1	yellow	unused
L2	yellow	LED indicating that a SUSI client (ARENA ^{AX} , COACH ^{AX} or ARENA 3.0) is connected
Tx	yellow	RS485-1 status LED indicating transmission of C-Bus signals
Rx	yellow	RS485-1 status LED indicating reception of C-Bus signals.
⚠	red	status LED indicating hardware problems
⏻	green	power LED

See also section "Troubleshooting" on page 23 for a detailed description of the behaviors of the LEDs and their meanings.

RS485 Interface

General

The CLIF-CBUSLC has one C-Bus interface:

- RS485-1 (consisting of push-in terminals 24 [GND-1], 25, and 26) is isolated.

RS485-1 Bias and Termination Resistors

RS485-1 is equipped with a three-position slide switch which can be used to switch its bias resistors OFF (position "MID" – this is the default and the **only allowed setting**), ON (position "BIAS"), and ON with an additional 150Ω termination resistor (position "END").

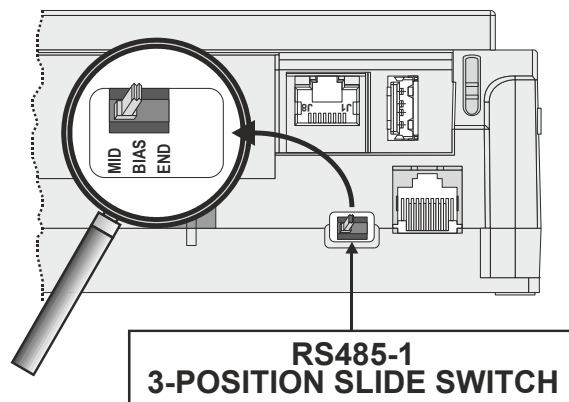


Fig. 10. RS485-1 three-position slide switch

The slide switch setting must remain in the leftmost position for "MID".

Table 6. Required slide switch settings

setting	remarks
END	DO NOT USE!
BIAS	DO NOT USE!
MID	For C-Bus communication, the switch must be in the leftmost position.

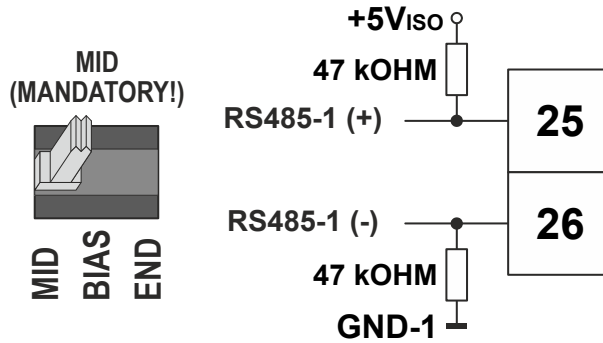


Fig. 11. RS485-1 three-position slide switch setting MID

RS485 Standard

According to the RS485 standard (TIA/EIA-485: "Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems"), only one driver communicating via an RS485 interface may transmit data at a time. Further, according to U.L. requirements, the RS485 interface may be loaded with a max. of 32 unit loads. A max. of 29 C-Bus devices may be connected.

IMPORTANT

The cable length affects the baud rate. See Table 7.

Table 7. Baud rate vs. max. cable length for RS485

Baud rate	Max. cable length (L)
9.6 - 76.8 kbps	1200 m

For information on wire gauge, max. permissible cable length, possible shielding and grounding requirements, and the max. number of devices which can be connected to a bus, refer to standard EIA-485.

MOUNTING/DISMOUNTING

Before Installation

IMPORTANT

To allow the evaporation of any condensation resulting from low shipping / storage temperatures, keep the device at room temperature for at least 24 h before applying power.

US requirement, only: This device must be installed in a UL-listed enclosure offering adequate space to maintain the segregation of line voltage field wiring and Class 2 field wiring.

In the case of vertical mounting on DIN rails, the CLIF-CBUSLC should be secured in place using a commercially-available stopper. See also the CLIF-CBUSLC – Mounting Instructions (MU1Z-1026GE51).

Dimensions

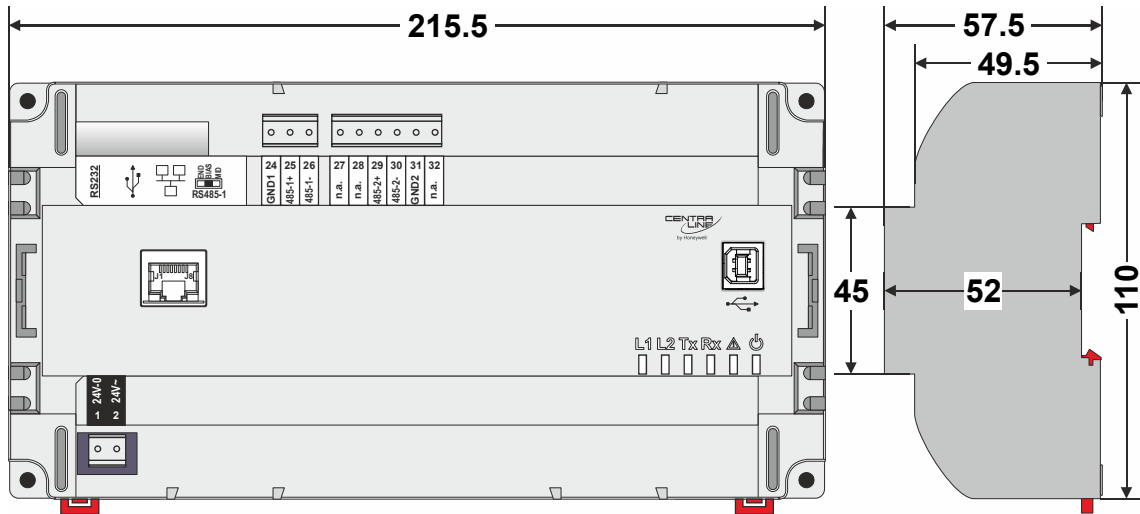


Fig. 12. CLIF-CBUSLC (shown: model with onboard I/Os), dimensions (in mm)

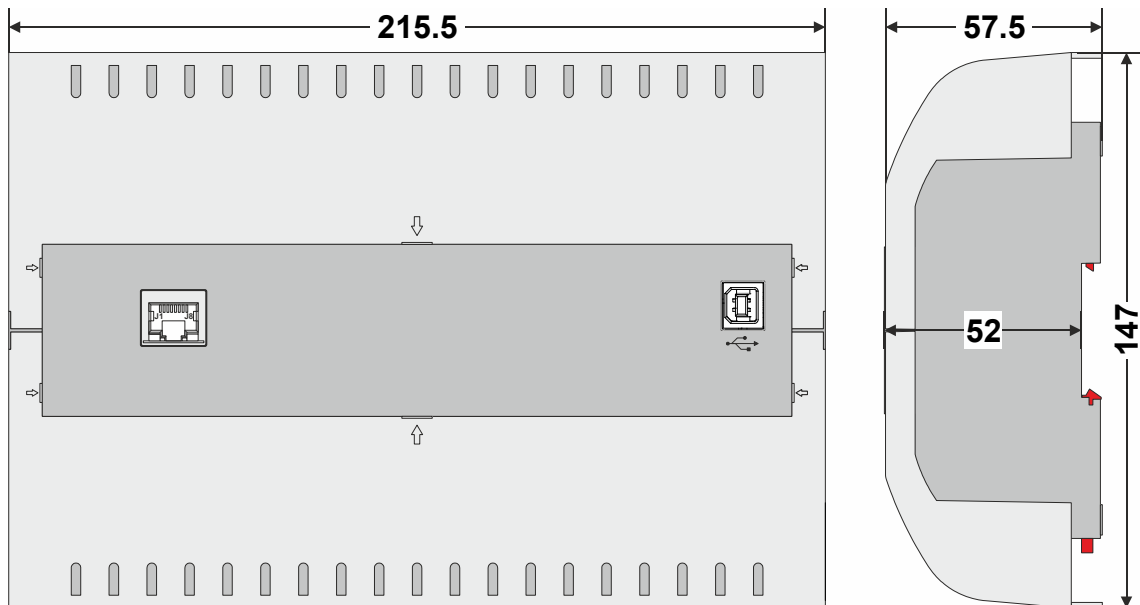


Fig. 13. CLIF-CBUSLC with covers, dimensions (in mm)

NOTE: Use of the covers (MVC-80-AC1) obstructs access to the Ethernet and USB 2.0 Host Interfaces and RS232 socket.

WIRING AND SET-UP

General Safety Considerations

- All wiring must comply with applicable electrical codes and ordinances, including VDE, National Electric Code (NEC) or equivalent, and any local regulations must be observed. Refer to job or manufacturer’s drawings for details. Local wiring guidelines (e.g., IEC 364-6-61 or VDE 0100) may take precedence over recommendations provided here.
- Electrical work should be carried out by a qualified electrician.
- Electrical connections must be made at terminal blocks.
- For Europe only: To comply with CE requirements, devices with a voltage in the range of 50 ... 1000 VAC or 75 ... 1500 VDC which are not provided with a supply cord and plug or with other means for disconnection from the supply having a contact separation of at least 3 mm in all poles must have the means for disconnection incorporated in the fixed wiring.

WARNING

Risk of electric shock or equipment damage!

- Observe precautions for handling electrostatic sensitive devices.
- Do not touch any live parts in the cabinet.
- Do not open the device housing.
- Disconnect the power supply before making connections to or removing connections from terminals of the CLIF-CBUSLC and devices wired to it.
- Do not use spare terminals as wiring support points.
- To prevent risk of injury due to electrical shock and/or damage to the device due to short-circuiting, low-voltage and high-voltage lines must be kept separate from one another.
- All terminals are protected (up to 24 Vac) against short-circuiting and incorrect wiring. Higher voltages may damage the device.
- Do not reconnect the power supply until you have completed the installation.

Fusing Specifications

System Fusing

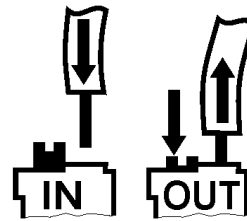
We recommend that the system be equipped with an external fuse.

Fusing of Active Field Devices

F2 (depends upon given load).

Wiring Terminals

The CLIF-CBUSLC is equipped with push-in terminal plugs.



use Cu only

Fig. 14. Inserting/removing wires from push-in terminals

NOTE: With solid conductors, ferrules are prohibited.

NOTE: Use only one conductor per push-in terminal.

NOTE: If, nevertheless, two stranded wires are to be connected to a single push-in terminal, twin wire end ferrules must be used.

Table 8. CLIF-CBUSLC push-in terminal wiring specifications

plug gauge	0.2 ... 1.50 mm ²
solid conductor H05(07) V-K	0.2 ... 1.50 mm ²
stranded conductor H05(07) V-K	0.2 ... 1.50 mm ²
stranded conductor with wire end ferrules (w/o plastic collar)	0.2 ... 1.50 mm ²
stripping length	10.0 +1.0 mm

Terminal Assignment

Table 9. Terminal assignment

term.	signal	description
1	24V-0	supply voltage (GND), internally connected with terminal 31
2	24V~	supply voltage (24V)
24	GND-1	reference GND of RS485-1 (isolated)
25	485-1+	"+" signal for RS485-1 (isolated)
26	485-1-	"-" signal for RS485-1 (isolated)
27,28		not used
29	485-2+	not used
30	485-2-	not used
31	GND-2	not used
32	-	not used

Power Supply

Powering CLIF-CBUSLC

Power is supplied via a removable terminal plug (attached to terminals 1 and 2).

The power supply of the CLIF-CBUSLC must conform to Safety Class II. To reduce overall current consumption, the CLIF-CBUSLC can be powered by a switch power supply (rather than by a transformer). See also Table 3 on pg. 3.

NOTE: Danger of short-circuiting when another controller besides the CLIF-CBUSLC is supplied by the same transformer if proper polarity is not ensured. See Fig. 15.

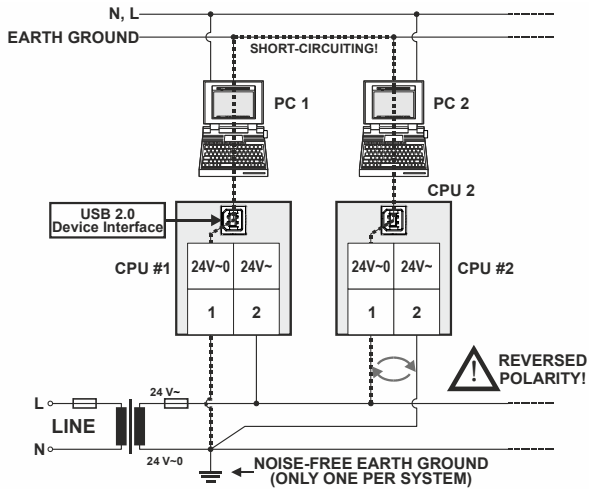


Fig. 15. Incorrect polarity → SHORT-CIRCUITING!

RIN-APU24

The RIN-APU24 Uninterruptable Power Supply can be directly wired to a CLIF-CBUSLC.

See RIN-APU24 Uninterruptable Power Supply – Mounting Instructions (Product Literature no.: EN0B-0382GE51) for a detailed wiring diagram.

Lightning Protection

Please contact your local Honeywell representative for information on lightning protection.

Transformer Data

In Europe, if the CLIF-CBUSLC is powered by transformers, then such transformers must be safety isolating transformers conforming to IEC61558-2-6. In the U.S. and Canada, if the CLIF-CBUSLC is powered by transformers, then such transformers must be NEC Class-2 transformers.

Table 10. 1450 series transformers data

part # 1450 7287	primary side	secondary side
-001	120 Vac	24 Vac, 50 VA
-002	120 Vac	2 x 24 Vac, 40 VA, 100 VA from separate transformer
-003	120 Vac	24 Vac, 100 VA, 24 Vdc, 600 mA
-004	240/220 Vac	24 Vac, 50 VA
-005	240/220 Vac	2 x 24 Vac, 40 VA, 100 VA from separate transformer
-006	240/220 Vac	24 Vac, 100 VA, 24 Vdc, 600 mA

Table 11. Overview of CRT Series AC/DC current

transformer	primary side	max. AC current	max. DC current
CRT 2	230 Vac	2 A	500 mA
CRT 6	230 Vac	6 A	1300 mA
CRT 12	230 Vac	12 A	2500 mA

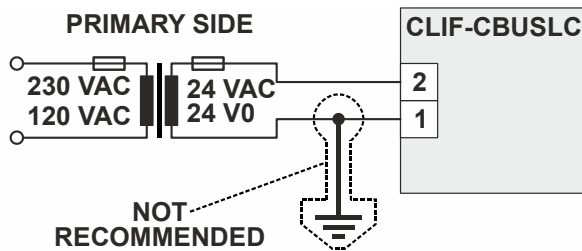


Fig. 16. Connection of CLIF-CBUSLC

SOFTWARE COMPATIBILITY

The CLIF-CBUSLC has been designed for software compatibility with the latest C-BUS devices used in CentralLine legacy projects.

The following list contains all the Building Management Systems and Integration Controllers that support full or partial integrations via CLIF-CBUSLC.

Building Supervisors

- ARENA AX 3.8.111.xx or higher*
- ARENA NX 4.2.36.34.2.11 or higher*
- ARENA 3.00.03 or higher

Integration Controllers

- HAWK300, HAWK400, HAWK600 3.8.38.44; 3.8.111.xx or higher*
- EAGLEHAWK 3.8.111.xx or higher*
- HAWK8000 4.2.36.34.2.11 or higher*
- EAGLEHAWK NX 4.4.73.24.0.18 or higher*

*CLIF-CBUSLC assumes an installed C-BUS driver on AX or NX Building supervisors or Integration Controllers.

Table 12 lists the compatible controller versions supported by the current CLIF-CBUSLC release:

Table 12. Compatible controllers currently supported

Software	Version number
Excel 50/ PANTHER Controllers Physical CBUS (LON ID = 0) and C-Bus via LON (LON ID > 0)	2.00.01 or later
Excel 80 Controllers	1.03.04 or later
Excel 100 B with XD505 card	1.05.00 or later
XL100C	1.03.04 or later
Excel 500 Controllers XC5010B with XD508 card	1.03.04 or later
Excel 500 Controllers (1.3 Hardware XC5010C)	1.03.04 or later
Excel 600 Controller	1.03.04 or later
XL800/ LION Controllers Physical CBUS and C-Bus via LON	3.02.02 or later
Elink with XD505 card	1.02.01 or later
MCR200	2.00.15 or later
XL40 / TIGER C-Bus via LON (LON ID > 0)	2.00.01 or later

CLIF-CBUSLC FIRMWARE UPDATE

1. Connect PC with the CLIF-CBUSLC using a USB cable. (The Ethernet port of the CLIF-CBUSLC cannot be used for firmware update.)
2. Open your browser and enter the following network address: 192.168.255.241.
3. Log in with your password.
4. Click on the **Firmware** button.
5. Select **Firmware .xwa File:** and choose the firmware you want to download.

CLIF-CBUSLC Firmware

```
firmware_version=BNAC_1-00-03-02

xwssystem_version=2-00-01-08 (29-06-2018)
uboot_version=UBSCUBOOT_2-00-02-00
linux_version=UBC-Linux_2-00-05-15

sku_number=CLIF-CBUSLC
serial_number=001C8495
```

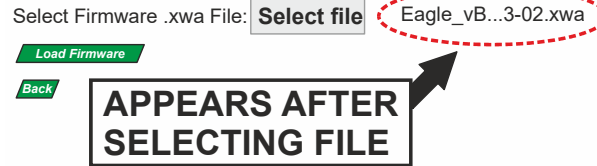


Fig. 17. Screen after choosing desired firmware

6. Click on the **Load Firmware** button.
7. After about 75 seconds, the web page shows the name of the downloaded file and the flash process begins.
8. The update process will take another approximately 3 minutes. After a while, the red LED will light up. When the red LED goes dark, the update is finished. It is now again possible to access the web page.

ENGINEERING, COMMISSIONING

Please refer also to ARENA^{AX} / COACH^{AX} – User Guide (Product Literature No.: EN2Z-0996GE51) and the CentralLine NX LonSock RNI Driver – User Guide (EN2Z-1054GE51) for detailed information.

Required Preparations

In order to access (with a laptop or PC) the CLIF-CBUSLC via Ethernet/IP for the first time, a password must be defined. For setup, you must connect a PC with a web browser to the USB 2.0 Device interface as described below.

USB 2.0 Device Interface

This USB 2.0 Device interface is the interface for setting up the communication settings and downloading new firmware. An "A-Male to B-Male" USB cable is required.

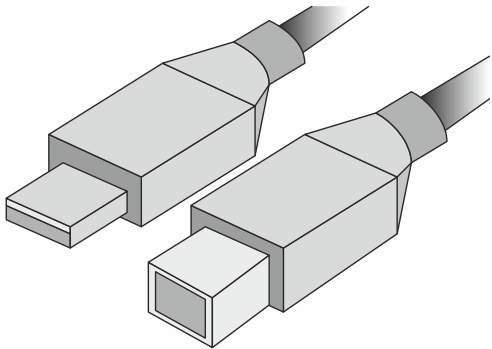


Fig. 18. A-male to B-male USB cable

For access via USB, the CLIF-CBUSLC has a permanent default IP address 192.168.255.241.

Set-Up

After removing the CLIF-CBUSLC from its shipping box, attach power and wait approx. 1 minute while it powers up. During power-up, the red warning LED (see Fig. 9 on pg. 10) will be lit. As soon as this warning LED goes dark, you may commence with the set-up, as follows:

1. Connect one end of the A-male to B-male USB cable (see Fig. 18) to your PC and the other end to the USB 2.0 Device Interface (see Fig. 6 on pg. 6) located on the front of your CLIF-CBUSLC.
2. Enter URL <http://192.168.255.241> in your web browser. An initial mask will then appear on the screen of your PC.
3. When setting up your CLIF-CBUSLC for the first time, you will have to enter an administrator password. This administrator password must contain:
 - 8 or more (but not more than 31) characters
 - uppercase letters
 - lowercase letters
 - numerals
 - no whitespace characters
4. A login mask will appear. You may now login using the administrator password.
5. Press the CONFIGURATION button.

6. The configuration mask (see Fig. 19) will then appear. Settings for the following connection options will be requested there:
 - Physical C-Bus
 - C-Bus over LonWorks (virtual C-Bus)
 - Standard LONWORKS (requires Niagara 4.4 or higher and NX LonSock RNI Driver – file name "lonsockClient-rt.jar")
7. Settings in section "Ethernet settings" are valid in general for all three options. Enter the IP address, subnet mask and default gateway address. Do **not** select "block SUSInet port" as this is needed only if you want to tunnel SUSInet communication over ssh.
8. Section "Physical C-Bus" lists the specific settings for option "Physical C-Bus".
If you want your interface to synchronize the time of your bus devices on an hourly basis, select "work as time master". Setting "default token passing mechanism" allows the selection "automatic, ring (for COV mechanism) or star (for polling mechanism)". This may be overridden by the Supervisor
9. Settings in section "LON settings" are valid in general for the two LONWORKS options. Enter the communication parameters "subnet, node and domain". You can retrieve this information from the engineering tool. Setting "neuron ID" can't be modified. It is read from the LON interface IF-LON2.
The prerequisite for this is that the IF-LON2 LON interface has been connected to the CLIF-CBUSLC's USB 2.0 Host Device interface using the IF-LON2's micro USB cable.
10. If you are using the "C-Bus over LONWORKS" option, you must also enter the bus ID in section "C-Bus over LON". The bus ID must be the same for all devices connected to the C-Bus. The default is "1".
If you want your interface to synchronize the time of your bus devices on an hourly basis, select "work as time master".
11. For option "Standard LONWORKS", select "work as RNI driver in section "Standard LON". This enables Standard LONWORKS access via CLIF-CBUSLC.
12. Press "SAVE CONFIGURATION". When you are done, you may log out or go back to the status display.

CLIF-CBUSLC Configuration

ETHERNET Settings

IP:
 mask:
 default gateway:
 MAC:
 SUSInet port: (default: 2499, must be ≥ 1024)
 ssh port: (cannot be changed)
 block SUSInet port: (only tunneled SUSInet communication)
 disable ping:
 initial SUSInet timeout: (default: 30sec)

Physical C-Bus (RS485-1)

work as time master:
 default token passing mechanism: (may be overridden by supervisor)
 termination resistors: The 3-position slide switch must always be in the "MID" position. (See Connection Diagram). If mounted at an end of a line, a 120 Ω termination resistor must be connected.

LON Settings

subnet:
 node:
 domain: (1, 3, or 6 byte hex value)
 neuron ID:

C-Bus over LON (USB / IF-LON2) | **Standard LON (USB / IF-LON2)**

bus ID: (default = 1) | work as RNI server:
 work as time master:

[Back](#) [Reset Form](#) [Save Configuration](#) [Change Password](#) [Connection Diagram](#)

Fig. 19. CLIF-CBUSLC configuration mask

NOTE: Regarding time master functionality, the CLIF-CBUSLC does not observe daylight saving time. If your controllers do observe automatic daylight saving time, we recommend that you not use the time master functionality. If there is a local workstation permanently on the bus, we recommend that this workstation should be responsible to synchronize date and time.

NOTE: If you wish to use the CLIF-CBUSLC as a Standard LonWorks interface for Niagara, the same subnet, node, and domain which you configure in the CLIF-CBUSLC configuration mask (see Fig. 20) has to be set in Niagara workbench. You must therefore enter the same domain in the Property Sheet next to "Lon Netmgmt". Specifically, change the length from its default ("0") to "1", "3", or "6", as the case may be. The "Id" box will then appear (see Fig. 20), into which you should then enter the ID of the domain as defined in the CLIF-CBUSLC configuration mask.

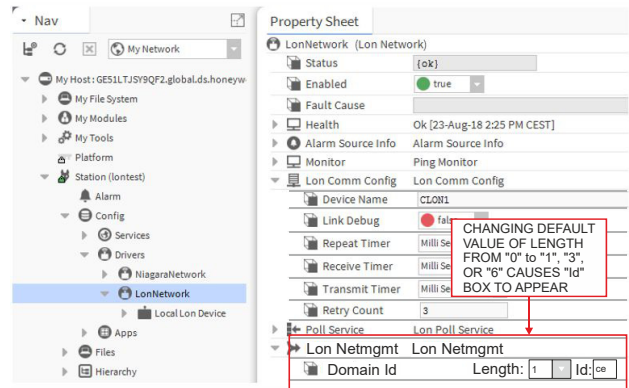
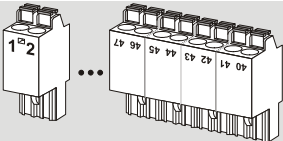
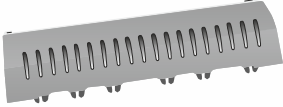


Fig. 20. NX LonSock RNI Driver configuration mask

EXTRA PARTS

Table 13. Extra parts

	order no.	Description
	TPU-11-01	Removable terminal plugs, push-in type; complete set of 3 plugs (for terminals 1, 2, 24-32); for the CLAXEH00ND100A.
	TPU-45-01	Removable terminal plugs, push-in type; complete set of 9 plugs (for terminals 1 - 47); for the CLAXEH14ND100A and CLAXEH26ND100A.
	MVC-80-AC1	Terminal cover (color: RAL9011); package of ten.

LONWORKS COMMUNICATIONS

General Information

The CLIF-CBUSLC can be connected to LONWORKS networks. This requires the use of an IF-LON2 (see section "IF-LON2" below), which is then plugged into to the CLIF-CBUSLC's USB 2.0 Host Interface (see also section "USB 2.0 Host Interface" on pg. 5).

This permits individual CLIF-CBUSLC Interfaces to be connected / disconnected from the LONWORKS network without disturbing the operation of other devices.

The LONWORKS network is insensitive to polarity, eliminating the possibility of installation errors due to miswiring.

Different network configurations (daisy-chain, loop, and star configurations, or any combination thereof) are possible. See also Excel 50/500 LONWORKS Mechanisms Interface Description (Product Literature no.: EN0B-0270GE51).

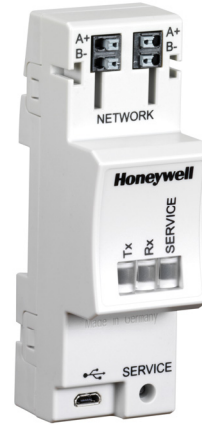


Fig. 21. IF-LON2

See also IF-LON2 – Mounting Instructions (Product Literature no.: MU1B-0545GE51).

Depending upon the chosen network configuration, one or two terminations may be required.

The following LONWORKS termination module is available:

- LONWORKS connection / termination module (mountable on DIN rails and in fuse boxes), order no.: **XAL-Term2**

Connecting to a LONWORKS Network

IMPORTANT

Do not bundle wires carrying field device signals or LONWORKS communications together with high-voltage power supply or relay cables. Specifically, maintain a min. separation of 3 inches (76 mm) between such cables. Local wiring codes may take precedence over this recommendation.

IMPORTANT

Try to avoid installing in areas of high electromagnetic noise (EMI).

Cable Types

The unit must be wired to the LONWORKS network using either

- level IV 22 AWG (Belden part number 9D220150)
- or
- plenum-rated level IV 22 AWG (Belden part number 9H2201504) non-shielded, twisted-pair, solid-conductor wire.

When possible, use Honeywell AK3781, AK3782, AK3791, or AK3792 cable (US part numbers). See Excel 50/5000 LONWORKS Mechanisms (Product Literature no.: EN0B-0270GE51), for details, including maximum lengths.

Use wire with a minimum size of 20 AWG (0.5 mm²) and a maximum size of 14 AWG (2.5 mm²).

IF-LON2

Optionally, communication with physical I/O modules, with room and zone controllers, and with CentraLine PANTHER, TIGER, and LION controllers can utilize LonTalk.

The IF-LON2 is equipped with a free-topology transceiver (FTT10A) for communication (at a data transmission rate of 78 Kbaud) on LONWORKS® networks (using the LonTalk protocol).

The LONWORKS network is insensitive to polarity, eliminating the possibility of installation errors due to miswiring. Different network configurations (daisy-chain, loop, and star configurations, or any combination thereof) are possible. See Excel 50/5000 LONWORKS Mechanisms (Product Literature no.: EN0B-0270GE51) for details.

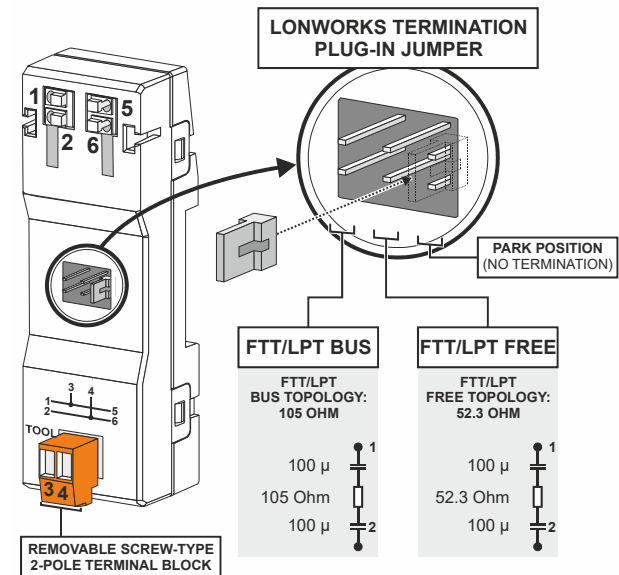


Fig. 22. LONWORKS connection and termination module

C-BUS CONNECTION

The CLIF-CBUSLC features an RS485 interfaces to which C-Bus devices can be connected: RS485-1 (consisting of push-in terminals 24 [GND-1], 25, and 26).

C-Bus Topologies

Via the C-Bus, up to 30 C-Bus devices (e.g., controllers, etc.) can communicate with one another and a PC central. The C-Bus must be connected via the individual controllers (open ring).

NOTE: Star connection is not allowed, as this might cause uncontrollable line reflections.

Instead of CLIF-CBUSLC Interfaces, C-Bus controllers (e.g., the Excel 500, Excel 100, LION, PANTHER) can also be connected.

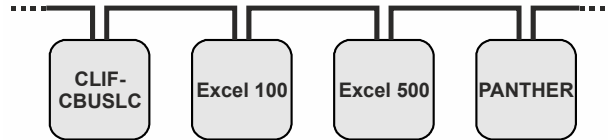


Fig. 23. C-Bus topology Excel 5000

C-Bus Cables

NOTE: Observe national regulations for C-Bus cables!
 For Europe; only shielded cable is permitted.
 For the U.S., shielded or unshielded cable can be used.

Cable type	Description	Recommended for
J-Y-(ST)Y 2 x 2 x 0.8	shielded, twisted pair	Europe, inside cabinet
A-Y-(ST)Y 2 x 2 x 0.8	shielded, twisted pair	Europe, outside cabinet
AK 3702	unshielded, twisted pair	US not approved for Europe
AK 3740A	shielded	US (low-cost) not approved for Europe
Belden 9842	twisted pair	Europe, US also possible
Belden 9841	shielded	US
AK 3702	unshielded, twisted pair	US not approved for Europe
AK 3740A	shielded	US (low-cost) not approved for Europe

Table 14. C-Bus cable types

Connecting CLIF-CBUSLC via RS485-1 to C-Bus

- NOTE:** Always power each CLIF-CBUSLC and the connected C-Bus devices via separate transformers.
- NOTE:** The max. C-Bus cable length is 1200 m (4000 ft).
- NOTE:** If any devices are not electrically isolated, signal ground connection is recommended. See section "RS485 Standard" on pg. 11.
- NOTE:** If the CLIF-CBUSLC is connected at either of the line's two ends, an additional termination resistor ($R_T = 120\ \Omega$) is necessary.
- NOTE:** Regardless of the position of the CLIF-CBUSLC along the C-Bus, the 3-position switch must be set to MID.

Example: CLIF-CBUSLC and Connected C-Bus Devices

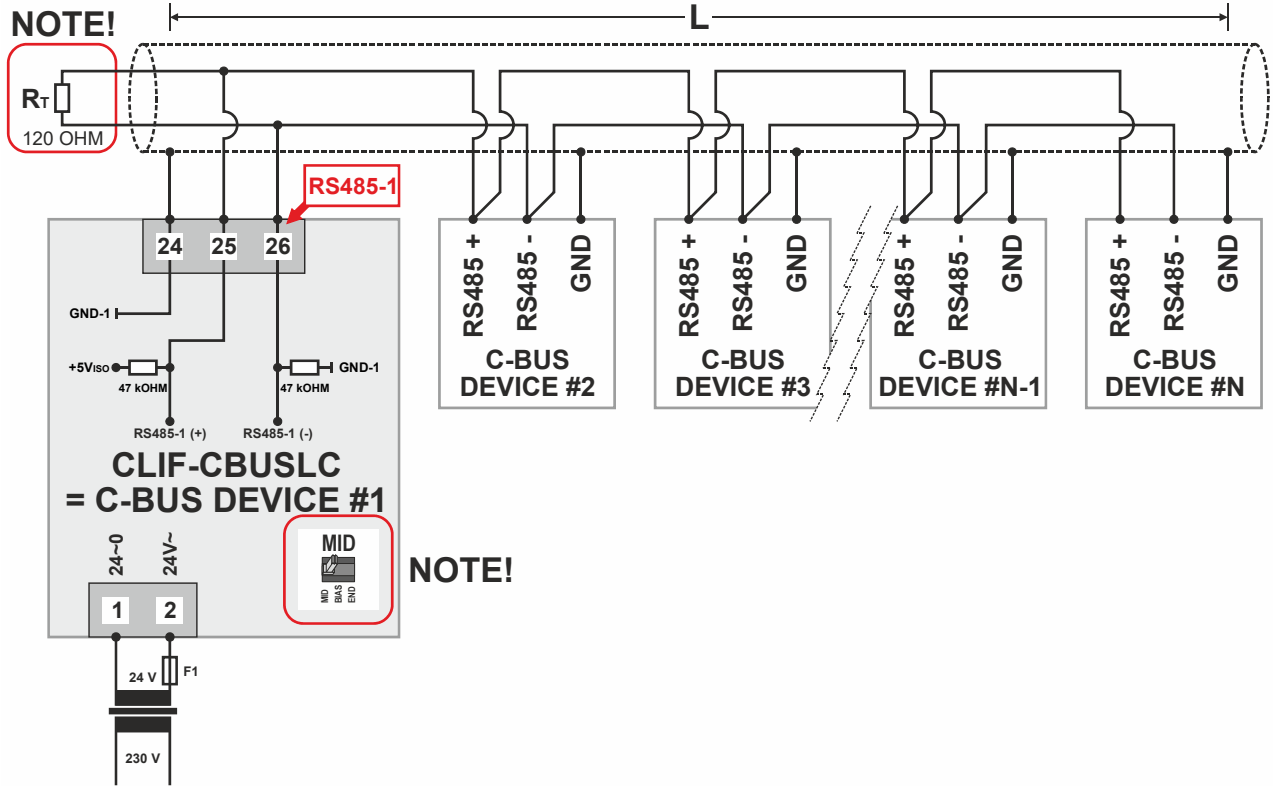


Fig. 24. Connection of a CLIF-CBUSLC via its RS485-1 interface to a C-Bus

EFFECT OF POLL RATE + SUBSCRIBED POINTS ON CPU LOAD

The poll rate set for the CLIF-CBUSLC and the chosen number of subscribed datapoints both make a demand on the CPU load. The following recommendations are therefore applicable.

C-Bus-Related Size Recommendations

Table 15. Recommended application sizes per controller and per project

	Operating System: WIN xx 32-bit	Operating System: WIN xx 64-bit
No. of controllers	9...13 LION controllers	15...17 LION controllers
	15...17 PANTHER / TIGER controllers	15...17 PANTHER / TIGER controllers
No. of datapoints	Max. 381 per LION controller	Max. 381 per LION controller
	Max. 381 per PANTHER / TIGER controller	Max. 381 per PANTHER / TIGER controller
No. of datapoints per project	4953	5715
No. of I/O modules per LION controller	Max. 16 (We recommend using only Panel Bus I/O modules since they do not count as LONWORKS devices.) As many 25 I/O modules (combination of Panel Bus I/O modules and LONWORKS I/O modules) are possible, but with some risk.	Max. 16 (We recommend using only Panel Bus I/O modules since they do not count as LONWORKS devices.) As many 25 I/O modules (combination of Panel Bus I/O modules and LONWORKS I/O modules) are possible, but with some risk.
No. of time programs per controller	up to ≤ 64	Max. 64 As many as 100 time programs per controller are possible, but with some risk.

Table 16. Recommended limits for CLIF-CBUSLC and C-Bus communication

		No. of C-Bus devices engineered with...		No. of data-points	No. of NVs	Update rate (data-points per min.)*
		COACH	CARE			
Virtual C-Bus (i.e., C-Bus via LONWORKS)	local sys.	15	29	10,000	10,000	500
	remote sys.	15	29	10,000	10,000	250
Physical C-Bus systems	9,600 bps	15	29	10,000	--	500
	76,800 bps	15	29	10,000	--	1,000

* This corresponds mainly to the no. of datapoints in trend if these datapoints do not update faster than once per minute. In the case of physical C-Bus systems, the update rate of each datapoint can be influenced by the user (i.e., by changing the attribute "trend hysteresis").

TROUBLESHOOTING

General

The following LEDs of the CLIF-CBUSLC can be used for troubleshooting purposes:

- Power LED (green)
- Status LED (red)
- L2 LED (yellow)
- Tx (sending data on RS485-1) and Rx (receiving data on RS485-1) LED

Power LED (green) of CLIF-CBUSLC

Table 17. CLIF-CBUSLC power LED

case	power LED	meaning	remedy
1	ON	Normal operation	No action necessary.
2	OFF	Power supply not OK.	<ul style="list-style-type: none"> ▶ Check power supply voltage. ▶ Check wiring. ▶ If problem persists, replace hardware.

Status LED (red) of CLIF-CBUSLC

Table 18. CLIF-CBUSLC status LED

case	status LED	meaning	remedy
1	OFF after power-up	Normal operation.	No action necessary.
2	ON continuously after power-up	– No or invalid firmware	<ul style="list-style-type: none"> ▶ Try powering down and then powering up the CLIF-CBUSLC. ▶ If problem persists, replace hardware.

L2 LED

Table 19. CLIF-CBUSLC L2 LED

case	bus LEDs	meaning	remedy
1	ON continuously after power-up	A SUSI client (ARENA ^{AX} , COACH ^{AX} or ARENA 3.0) is connected	No action necessary.
2	Dark	No client is connected	▶ If you are unable to establish communication, check IP address, SUSI port number, ...

Tx and Rx LEDs

Table 20. CLIF-CBUSLC Tx and Rx LEDs

case	bus LEDs	meaning	remedy
1	Both Tx and Rx are flashing	Normal operation; RS485-1 is functioning properly.	No action necessary
2	Both Tx and Rx are OFF	No communication on RS485-1.	▶ Switch ON communication on RS485-1. Further handling like case 4 (below).
3	Rx is flashing and Tx is OFF	Communication on RS485-1 has been switched OFF, but the CLIF-CBUSLC is receiving data from controllers.	▶ Use client to establish a connection with correct device ID and baud rate
4	Tx is flashing and Rx is OFF	The CLIF-CBUSLC is attempting to establish communication on RS485-1, but there is no answer.	▶ The communication rate (Kbaud) on RS485-1 has not been correctly set; controllers on the C-Bus may have been setup incorrectly; wiring problem or hardware defect.

APPENDIX 1: EARTH GROUNDING

CLIF-CBUSLC and SELV

In order to avoid distribution of noise or earth ground potential differences over networks or other connections, the CLIF-CBUSLC is designed to be in compliance with SELV (Safety Extra-Low Voltage).

Furthermore, SELV offers the greatest possible safety against electrical impact.

To support SELV, all Honeywell external (CRT series) or internal transformers comply with standard EN60742.

Earth grounding is therefore not recommended.

CLIF-CBUSLC and Standard EN60204-1

However, if compliance with EN60204-1 is required, note the following:

General Information about EN60204-1

EN60204-1 defines electrical safety for a complete application / machine including controllers, sensors, actuators and any connected/controlled electrical device.

EN60204-1 requires controllers to be powered by PELV (Protective Extra-Low Voltage) and earth grounding of the secondary side of the used transformers or earth grounding of the system ground.

Earth grounding is prescribed to prevent unexpected start-up of connected rotating/moving machines due to an insulation fault and double earth grounding somewhere in the plant.

In order to fulfill PELV (if earth grounding is prohibited), the use of an earth leakage monitor is also possible.

When is EN60204-1 Applicable to CLIF-CBUSLC Systems?

- **Safety against electrical impact**
 - EN60204-1 is not mandatory; this is because electrical safety is provided by the use of SELV and transformers according to standard EN60742.
- **Safety against unexpected start-up of rotating/moving machines**
 - If the application/plant does not contain machines that can be harmful to the operator due to an unexpected start-up, the standard EN60204-1 is not applicable.

If such machines are encountered, then EN60204-1 must be followed. Grounding is required.

Earth Grounding of EN60204-1 Applicable Systems

NOTE: Our recommendation is that each CPU be supplied with electricity from its own dedicated transformer.

- ▶ If system protective earth grounding is planned, use a cable as short as possible for grounding: min. 1.5 mm² (16 AWG).
- ▶ For connection details, refer to the following examples.

Example 1

The following explains how to connect and earth multiple CPUs (e.g., multiple CLIF-CBUSLCs, PANTHERs, TIGERs, LIONs, etc. or any combination thereof) earth-grounded as per EN60204-1.

NOTE: Use a noise-free earth ground inside the cabinet.

NOTE: If a field device that prohibits earth grounding is connected to the system ground, an isolation monitoring device must be used instead of earth grounding.

- ▶ Connect earth ground to the respective terminal of the CPU, see Fig. 26.

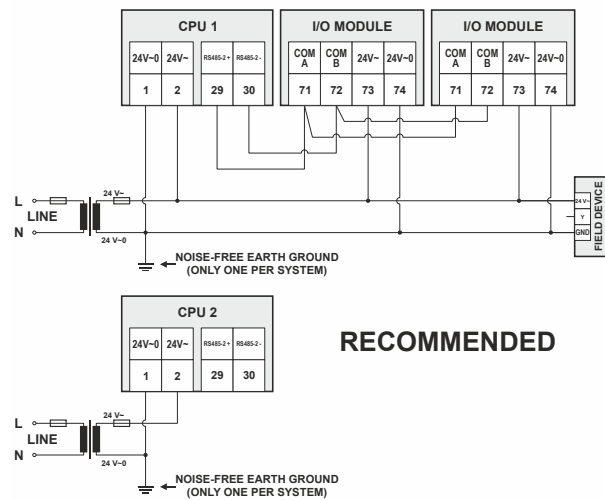


Fig. 25. Connecting and earthing multiple CPUs (RECOMMENDED USE OF SEPARATE TRANSFORMERS)

Example 2

When connecting multiple CPUs to a single transformer, it is imperative that the polarity of the power supply terminals of the CPUs and the polarity of the transformer always correspond (namely: 24V-0 of the transformer must always be connected to 24V-0 of the CPU, and 24V~ of the transformer must always be connected with 24V~ of the CPU).

Depending upon the individual CPU, the numbering of the corresponding two terminals may possibly deviate from the norm (which is usually "terminal 1 = 24V-0" and "terminal 2 = 24V~"). In the following example, CPU 3 has a deviating numbering and must be connected accordingly.

NOTE: When using a single transformer for several CPUs, each CPU ground must be wired separately to the star-point.

NOTE: If the field device transformer is physically far away from the CPUs, earth grounding must still be performed for the controller.

NOTE: Use one star-point to split power for multiple CPUs and field devices.

► Connect earth ground to the proper terminal of the CPU.

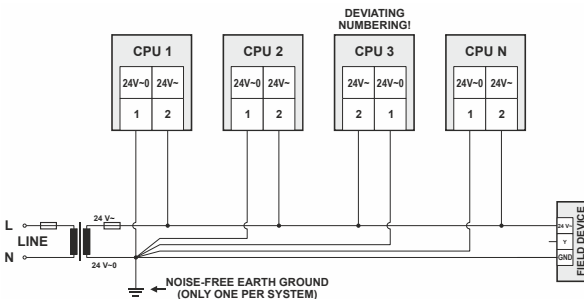


Fig. 26. Connecting and earthing multiple CPUs

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