vsm LCD Button Panels

User Manual

Version: 4.0/1

Edition: 31 March 2017

Revision History

Version	Edition	Changes	Firmware Version
1	2014-05-20	Initial draft	2.40
2	2014-06-13	Initial Release	2.40
3	2014-08-27	LBP 51 Power Consumption corrected	2.40
4.0/1	2017-03-31	New Overview graphics & template	2.46

To obtain the latest documentation and software downloads, please visit:

www.lawo.com/downloads

Table of Contents

1. Welcome

About this Manual

This document describes how to install and setup the **vsm LCD Button Panels (LBP)** within a VSM system.

Note that a system may comprise several software and hardware components.

Other useful documents include the:

- **vsm Software User Manual** - more about **vsmStudio**, the main configuration and administration tool, plus other software components: **vsmPanel**, **vsmWebPanel**, **vsmTimeSync**, etc.
- **vsm Gear User Manuals** - more about other hardware panel and interface options.

All Lawo manuals are available from the **Download-Center** at www.lawo.com (after **Login**).

Look out for the following which indicate:

Notes - points of clarification.

Tips - useful tips and short cuts.

Warnings

Alert you when an action should *always* be observed.

Lawo User Registration

For access to the **Download-Center** and to receive regular product updates, please register at:

www.lawo.com/user-registration.

2. Important Safety Instructions

General Safety

Warning

Exposure to excessive sound pressure levels can lead to impaired hearing and cause damage to the ear.

Please read and observe ALL of the following notes:

- Check all of the hardware devices for transport damage.
- Any devices showing signs of mechanical damage or damage from the spillage of liquids MUST NOT be connected to the mains supply or disconnected from the mains immediately by pulling out the power lead.
- All devices MUST be grounded. Grounding connectors are provided on all devices. In addition, all low-voltage devices external to the system must also be grounded before operation.
- For Scandinavian countries, ALWAYS use a grounded mains connection, to prevent the device from being grounded through Ethernet or other signal connections.
- Do NOT use the system at extreme temperatures - observe the temperature range and humidity specified in the installation instructions.
- Do NOT expose devices to liquids which may drip or splash.
- Do NOT place objects filled with liquids, such as vases, upon a device.
- Only service staff may replace batteries.
- CAUTION: Danger of explosion if battery is incorrectly replaced - Replace only with the same or equivalent type.

Servicing of components inside a device MUST only be carried out by qualified service personnel according to the following guidelines:

- Before removing parts of the casing, shields, etc. the device MUST be switched off and disconnected from all mains.
- Before opening a device, the power supply capacitor MUST be discharged with a suitable resistor.
- Components that carry heavy electrical loads, such as power transistors and resistors, should NOT be touched until cool to avoid burns.

Servicing unprotected powered devices may only be carried out by qualified service personnel at their own risk. The following instructions MUST be observed:

- NEVER touch bare wires or circuitry.
- Use insulated tools ONLY.
- DO NOT touch metal semi-conductor casings as they can bear high voltages.

Eye Safety

Warning

This equipment may use Class 1 Laser products which emit invisible laser radiation that may lead to eye injury.

- NEVER look directly into optical components or optical fibre cables.
- Fit protection caps to close any unused optical components.
- Connect all optical fibre cables BEFORE turning on the equipment.

Defective Parts/Modules

Warning

vsm LCD Button Panels (LBP) contains no user-serviceable parts. Therefore DO NOT open the devices other than to perform the procedures described in this manual.

In the event of a hardware defect, please send the system component to your local service representative together with a detailed description of the fault. We would like to remind you to please check carefully whether the failure is caused by erroneous configuration, operation or connection before sending parts for repair. Please contact our service department before sending parts for repair.

First Aid (in the case of electric shock)

Warning

DO NOT touch the person or his/her clothing before power is turned off, otherwise you risk sustaining an electric shock yourself.

Separate the person as quickly as possible from the electric power source as follows:

- Switch off the equipment.
- Unplug or disconnect the mains cable.
- Move the person away from the power source by using dry insulating material (such as wood or plastic).

If the person is unconscious:

- Check their pulse and reanimate if their respiration is poor.
- Lay the body down and turn it to one side. Call for a doctor immediately.

Having sustained an electric shock, ALWAYS consult a doctor.

3. Introduction

The **vsm LCD Button Panels (LBP)** are remote panels specifically designed for use with **vsmStudio**. The panels can be configured to meet every production environment's requirement. A Single Destination, a Multiple Destination, a XY configuration or a combination of those alternatives is possible. The hardware panels provide multiple pages like the virtual panels. With the vsmStudio panel editor, LBP panels can be configured online or offline where online changes will be displayed in real-time.

The panels are connected to the vsmStudio control system via TCP/IP. The function possibilities of the LBP-series are manifold, for example they can perform routing, control devices - or signal parameters. Secondary functions enable multiple actions at one button push. With the aid of the panel editor of the vsmStudio software several panels can virtually be combined to one big panel. These features allow the implementation of every operating philosophy.

Each LBP-button integrates a Liquid Crystal Display (LCD) with R/G/B backlight enabling the operator to arrange any possible combination of functions, sources and targets across different pages. In addition to the Ethernet port every LBP provides two GPIs and two GPOs and an RS422 port (RS422 for external accessories only). The hardware panels are mounted into a solid steel coil coated housing and can be integrated into every production environment.

The LBP panels are available in a variety of different sizes and optionally for LBP-series only with one incremental encoder instead of one LCD-button. Additionally, a 1RU incremental encoder stripe with 17 rotary encoders or an RFID Tag Reader-box can be connected through the RS422 port of each LBP panel. All panels are to be powered by an external capsulated 12Volts DC stabilized power supply with a maximum of 3% Voltage discrepancy, a minimum current capability of 5A and external short-circuit-protection (fuse, circuit breaker or electronic short circuit-protection within the power supply).

Key Features:

- Every LBP without an incremental encoder is also available as a vsmSnap panel and can be used as a standalone fall-back panel. The vsmSnap panel stores a configuration and enables router control without the need of any other controller hardware.
- Software configurable buttons
- Each button capable of performing single or multiple functions simultaneously
- Each panel can be configured as "single destination", "multiple destinations", "XY" panel or any combination of these variations
- Every LBP has two low power GPIs and GPOs
- For LBP, an optional incremental encoder can be added for e.g. parameter entry
- Every LBP is equipped with Ethernet interface
- Button functions include: select sources or targets, GPI control, parameter control, macros, go-to, take, lock, enable, escape, shift and many more
- Every LBP enables offline and online configuration. All online changes occur in 'real-time' which eliminates downtime
- Every LBP without incremental encoder provides the option of being used as a "stand-alone" or "fall-back" panel to directly control a router without any router control system (SNAP-panel)
- One optional 1RU encoder-stripe with 17 incremental rotary encoders can be connected directly to each LBP via RS422, if no RFID Tag reader is used
- An optional RFID Tag Reader-box can be connected to each LBP through RS422 for access control, if no 1RU encoder-stripe is used
- Full colour R/G/B backlight at the LBP's allows the choice of multiple colours for button illumination.

4. Overview

4.1 E3 Buttons

LBP 8

Number of buttons	8 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	258mm x 43,7mm x 52mm (WxHxD):1RU/2
Weight	approx. 0,5KG
Power Consumption	< 3W @12VDC/0,25A max
Working Environment	0°C-50°C non condensing humidity

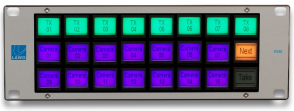
LBP 17

Number of buttons	17 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	483mm x 43,7mm x 53,1mm (WxHxD):1RU
Weight	approx. 1,0KG
Power Consumption	< 4,2W @12VDC/0,35A max
Working Environment	0°C-50°C non condensing humidity

LBP 16e

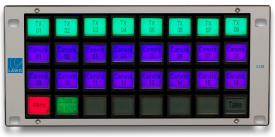
Number of buttons	16 LCD Buttons [E3] R/G/B-Backlight + 1 Encoder
Options	-
Communication port	1xEthernet
Dimensions	483mm x 43,7mm x 68,2mm (WxHxD):1RU
Weight	approx. 1,0KG
Power Consumption	< 4,2W @12VDC/0,35A max
Working Environment	0°C-50°C non condensing humidity

LBP 24



Number of buttons	24 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	258mm x 88mm x 53mm (WxHxD):2RU/2
Weight	approx. 0,8KG
Power Consumption	< 5W @12VDC/0,42A max
Working Environment	0°C-50°C non condensing humidity

LBP 32



Number of buttons	32 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	240mm x 111,5mm x 53mm (WxHxD):2,5RU/2
Weight	approx. 1,0KG
Power Consumption	< 6W @12VDC/0,5A max
Working Environment	0°C-50°C non condensing humidity

LBP 32-DT

Number of buttons	32 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	256mm x 83,6mm x 140,6mm (WxHxD)
Weight	approx. 3,6KG
Power Consumption	< 6W @12VDC/0,5A max
Working Environment	0°C-50°C non condensing humidity

LBP 31e-DT

Number of buttons	31 LCD Buttons [E3] R/G/B-Backlight + 1 Encoder
Options	-
Communication port	1xEthernet
Dimensions	256mm x 83,6mm x 140,6mm (WxHxD)
Weight	approx. 3,6KG
Power Consumption	< 6W @12VDC/0,5A max
Working Environment	0°C-50°C non condensing humidity

LBP 34

Number of buttons	34 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	483mm x 88mm x 53,2mm (WxHxD):2RU
Weight	approx. 1,4KG
Power Consumption	< 6,5W @12VDC/0,54A max
Working Environment	0°C-50°C non condensing humidity

LBP 33e

Number of buttons	33 LCD Buttons [E3] R/G/B-Backlight + 1 Encoder
Options	-
Communication port	1xEthernet
Dimensions	483mm x 88mm x 68,2mm (WxHxD):2RU
Weight	approx. 1,4KG
Power Consumption	< 6,5W @12VDC/0,54A max
Working Environment	0°C-50°C non condensing humidity

LBP 51

Number of buttons	51 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	483mm x 88mm x 52,8mm (WxHxD):2RU
Weight	approx. 1,7KG
Power Consumption	< 8,5W @12VDC/0,71A max
Working Environment	0°C-50°C non condensing humidity

LBP 50e

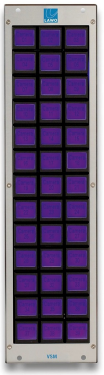
Number of buttons	50 LCD Buttons [E3] R/G/B-Backlight + 1 Encoder
Options	-
Communication port	1xEthernet
Dimensions	483mm x 88mm x 68,3mm (WxHxD):2RU
Weight	approx. 1,7KG
Power Consumption	< 8,5W @12VDC/0,71A max
Working Environment	0°C-50°C non condensing humidity

LBP 17X2 Hav-Panel (Desk-Mount)

Number of buttons	2x17 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	2xEthernet
Dimensions	915mm x 43mm x 53,3mm (WxHxD)
Weight	approx. 1,9KG
Power Consumption	< 4,2W @12VDC/0,35A max per PSU (2x)
Working Environment	0°C-50°C non condensing humidity

LBP 34V (vertical)

Number of buttons	34 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	65,1mm x 483mm x 59mm (WxHxD)
Weight	approx. 1,4KG
Power Consumption	< 6,5W @12VDC/0,54A max
Working Environment	0°C-50°C non condensing humidity



LBP 39V (vertical)

Number of buttons	39 LCD Buttons [E3] R/G/B-Backlight
Options	-
Communication port	1xEthernet
Dimensions	92mm x 355,50mm x 59mm (WxHxD)
Weight	approx. 1,3KG
Power Consumption	<7,2W @12VDC/0,6A max
Working Environment	0°C-50°C non condensing humidity

LBP 51V (vertical)

Number of buttons	51 LCD Buttons [E3] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	88,3mm x 483mm x 59mm (WxHxD)
Weight	approx. 1,7KG
Power Consumption	< 8,5W @12VDC/0,71A max
Working Environment	0°C-50°C non condensing humidity

4.2 NKK Buttons

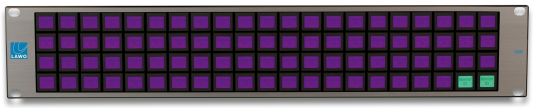
LBP 42

Number of buttons	42 LCD Buttons [NKK] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	483mm x 43,7mm x 53,3mm (WxHxD):1RU
Weight	approx. 1,3KG
Power Consumption	< 7,1W @12VDC/0,59A max
Working Environment	0°C-50°C non condensing humidity

LBP 41e

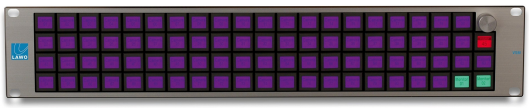
Number of buttons	42 LCD Buttons [NKK] R/G/B-Backlight + 1 Encoder
Options	-
Communication port	1xEthernet
Dimensions	483mm x 43,7mm x 69,3mm (WxHxD):1RU
Weight	approx. 1,8KG
Power Consumption	< 7,1W @12VDC/0,59A max
Working Environment	0°C-50°C non condensing humidity

LBP 84



Number of buttons	84 LCD Buttons [NKK] R/G/B-Backlight
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	483mm x 87,2mm x 56,5mm (WxHxD):2RU
Weight	approx. 2,1KG
Power Consumption	< 12,3W @12VDC/1,02A max
Working Environment	0°C-50°C non condensing humidity

LBP 83e



Number of buttons	83 LCD Buttons [NKK] R/G/B-Backlight + 1 Encoder
Options	VSM SNAP
Communication port	1xEthernet
Dimensions	483mm x 87,2mm x 70,5mm (WxHxD):2RU
Weight	approx. 1,7KG
Power Consumption	< 12,3W @12VDC/1,02A max
Working Environment	0°C-50°C non condensing humidity

4.3 LBP Accessories

Only one accessory connection per LBP panel is allowed.

ENC 17

Instead of one encoder mounted within a LBP panel, there is the option of adding an ENC 17 device in a 1RU 19”-housing mounted above or below any LBP panel.

The ENC 17 connects to the panel using RS422, via the RJ45 connectors on the rear of the LBP panel.

ENC 17

Number of Encoder	17 incremental encoder R/G/B-Backlight
Communication port	RS422 communication to LBP panel only
Dimensions	483mm x 43,7mm x 66,7mm (WxHxD):1RU
Weight	approx. 1,0KG
Power Consumption	3,5W @12VDC/0,29A max
Working Environment	0°C-50°C non condensing humidity

RF-ID-Tag Reader

A separate external RF-ID-Tag Reader can be added to each LBP panel. This allows several layouts only to appear, if authorised.

The RF-ID-Tag Reader connects to the panel using RS422, via the RJ45 connectors on the rear of the LBP panel.

RF-ID-Tag Reader

Communication port	RS422 communication to LBP panel only
Dimensions	85mm x 85mm x 40mm (WxHxD)
Weight	approx. 0,4KG
Power Consumption	< 1,5W @12VDC/0,125A max
Working Environment	0°C-50°C non condensing humidity

5. Operating Conditions

This device is built to be used in a non-condensing environment within a temperature range of 0-50°C. Under or overshooting this working temperature range may cause fast aging of components or even malfunction of the whole device.

Spillage of any liquids e.g. coffee, coke, water... onto/into the device may cause damage.

The storage temperature of the device must be within -20°C to 60°C with a maximum of 75% non-condensing relative humidity at 60°C @ 0VDC supply-voltage.

DO NOT throw, drop or bend the unit and make sure that there is no strong permanent mechanical pressure on any side of the housing at any time.

Before installing or using this device, always read and observe the Important Safety Instructions.

6. Preparing Panels for Operation

On startup all LBP Panels show the same device information on the first 6 buttons:

Device Monitor, Firmware Version, Panel ID, IP Address and MAC Address.

If the device has no physical link to the network, it will show “no network” status below the IP Address.

Thus there are no rotary hex encoders on the rear side of the device to configure the Panel ID, a long press on the Panel ID button will switch to a Panel ID configuration screen as long the device is not connected to any vsmStudio.

All Lawo devices will be shipped with DHCP enabled network configuration. If you don’t have a DHCP network ask your administrator for static network settings and edit the “Network” section if required.

Do the following settings in VSM Discover: 

Network	
Dhcp Address	False
Gateway	192.168.16.5
IP Address	192.168.17.157
IP Mask	255.255.248.0
Mac Address	00-13-16-01-2A-6E
Mode	100MBit-Full Duplex
Network Name	LBP84

Press “Apply” button in vsmDiscover if you are sure you have entered the settings correctly. The device will automatically perform a reboot to apply the network configuration.

To connect the device to vsmStudio edit the Server 1 - 4 and Panel ID in the “Application” section. There is also a possibility to connect an external serial device like an ENC17 or a RF-ID-Tag Reader. Please use the “Option: External Encoder” or “Option: RFID” field to enable this feature. A software reset is necessary for proper working external serial interface. Additional information can be found at VSM-LBP Accessories User Manual.

Application	
Hide Brightness	False
Option: External Encoder	Disabled
Option: RFID	Disabled
Panel ID	5
Server 1	192.168.17.38
Server 2	192.168.17.39
Server 3	192.168.17.40
Server 4	192.168.17.41

The Location and Comment fields in the “Misc” section can be set to easily allocate the device in your environment.

Misc	
Comment	CCR
Location	Studio 1

Additional read-only status and device information from vsmDiscover:

Status	
Current Primary	192.168.17.39
Current Secondary	0.0.0.0
Detection State	Online

Device	
Controls	84
Hardware ID	1
Hardware Revision	3
ID	5
Moniker	LBP84
Options	FFFF
Software ID	1
Software Version	240
Software Version CPLD	4

7. Preparing Accessories for Operation

Do the following settings in VSM Discover: 

To connect an external serial device like an ENC17 or a RF-ID-Tag Reader, please use the “Option: External Encoder” or “Option: RFID” field on the corresponding LBP panel to enable this feature. A software reset is necessary for proper working external serial interface.

Application	
Hide Brightness	False
Option: External Encoder	Disabled
Option: RFID	Disabled
Panel ID	5
Server 1	192.168.17.38
Server 2	192.168.17.39
Server 3	192.168.17.40
Server 4	192.168.17.41

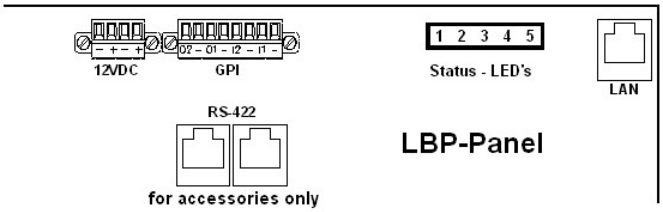
A powered and connected ENC 17 device will pulse blue on each encoder once, to indicate the device is ready for operation. Please define “Encoder Offset” and “Encoder LED Offset” in your vsmPanel properties.

A powered up and connected RFID-Tag Reader will turn on the status LED green, instead of blinking red. If a valid RFID card has been detected the status LED will blink blue.

8. Technical Specifications

8.1 Status LEDs

8.1.1 LBP Panels



Rear-view

1 (R/G/B): Lights blue: internal serial I/O controller OK, green: serial TX, red: serial RX.

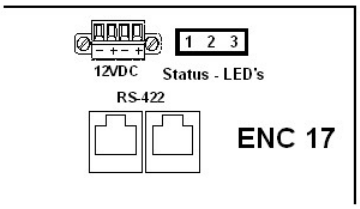
2 (R/G/B): Pulses red: no connection to the network.
Blinks fast red: device in bootloader-mode.
Pulses yellow: network connection established.
Pulses blue: connected to vsmStudio.

3 Green: Light, processor core-voltage OK.

4 Green: Light, internal I/O-voltage OK.

5 Orange: Blinks, physical LAN connection/TCP/IP-data-transfer.

8.1.2 ENC 17



Rear-view

1 Orange: Blinks: receiving data from LBP panel

2 Yellow: Blinks: transmitting data to LBP panel

3 Green: Light, internal voltage OK.

8.1.3 RFID Tag Reader

1 R/G/B: Blinks red: power on, no connection to vsmStudio.
Light green: valid connection to vsmStudio.
Blinks blue: RFID card detected and acknowledged by vsmStudio.

8.2 Buttons

LCD-Pushbuttons [E3]

Each pushbutton “SL 6432” made by “E3” has a mechanical size of (X x Y) 24.5mm x 23.5mm with a screen size (X x Y) of 17.26mm x 12.14mm. The resolution is (X x Y) 64x32 pixel with a pixel-dot-size of (X x Y) 0.25mm x 0.36mm.

The LCD backlight colour is R/G/B, so basically all colours desired can be used.

The key stroke of the tactile buttons is about 2.0mm +/-0.1mm using an operation force of approximately 1.3N +/-0.2N. Button-spacing of LBP panel is (X x Y) 25,4mm x 24,13mm.

All E3-buttons are placed on the PCB by sockets, so they can easily be exchanged, if damaged or worn out. The buttons can even be exchanged without powering down the LBP panel. After replacing the button without power-down, it might take view minutes until the button shows the right backlight colour as well as the desired button-label on the LCD.

LCD-Pushbuttons [NKK]

Each compact LCD pushbutton “IS15DSBFP4RGB” made by “NKK” has a mechanical size of (X x Y) 19mm x 18mm with a screen size (X x Y) of 12.78mm x 8.3mm. The resolution is (X x Y) 64x32 pixel with a pixel-dot-size of (X x Y) 0.18mm x 0.24mm.

The LCD backlight colour is R/G/B, so basically all colours desired can be used.

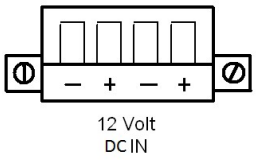
The key stroke of the tactile buttons is about 1.8mm +/-0.1mm using an operation force of approximately 1.7N +/-0.5N. Button-spacing of LBP panel is (X x Y) 20,32mm x 19,05mm.

8.3 Connectors (LBP Panels)

8.3.1 Power

Connector for 12 V DC-supply: 4-Pin connector (MC 1,5/ 4-STF-3,81) locked with two screws.

(Mounted on power-supply delivered with each LBP panel except Desktop-panels)



It is understood that if NOT using the original Power-Supply-Unit, you need to make sure that there is only one single 12V DC-supply with a maximum tolerance of 3% within the 12V. It has to be taken care, that the external supply uses a circuit-breaker, fuse or another kind of short-circuit-protection to never allow a current >5A @12VDC per device. Do NOT connect the device at reverse polarity at any time.

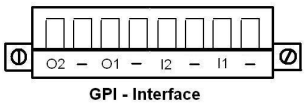
Additional connector (**Desktop-panels only**) for 12 V DC supply: 4-pin Hirose HR10A-7P-4P locked bayonet joint compact connector for better cable traction relief.

(Mounted on power-supply delivered with each LBP 31e-DT/ LBP32-DT panel)

Pin	Signal
1	GND
2	GND
3	+12V
4	+12V

It is understood that if NOT using the original Power-Supply-Unit, you need to make sure that there is only one single 12V DC-supply with a maximum tolerance of 3% within the 12V. It has to be taken care, that the external supply uses a circuit-breaker, fuse or another kind of short-circuit-protection to never allow a current >5A @12VDC per device. Do NOT connect the device at reverse polarity at any time.

8.3.2 GPI-Interface



GPI - Interface

Connectors for rear GPI-interface:

8-Pin connector locked with two screws (MC 1,5/ 8-STF-3,81)

Separate plug not included for standard LBP delivery.

Each LBP panel features two dry relays-outputs and 2 opto-coupled TTL-inputs.

Looking at the picture of the connector on the right hand side, you will find it labled:

O2 –	**O1 –**	**I2 –**	**I1 –**
I_____I	I_____I	I_____I	I_____I
Dry	Dry	Input/Gnd	Input/Gnd
Relay	Relay	[0…12VDC]	[0…12VDC]
OUT-No. 2	OUT-No. 1	IN-No.2	IN-No.1

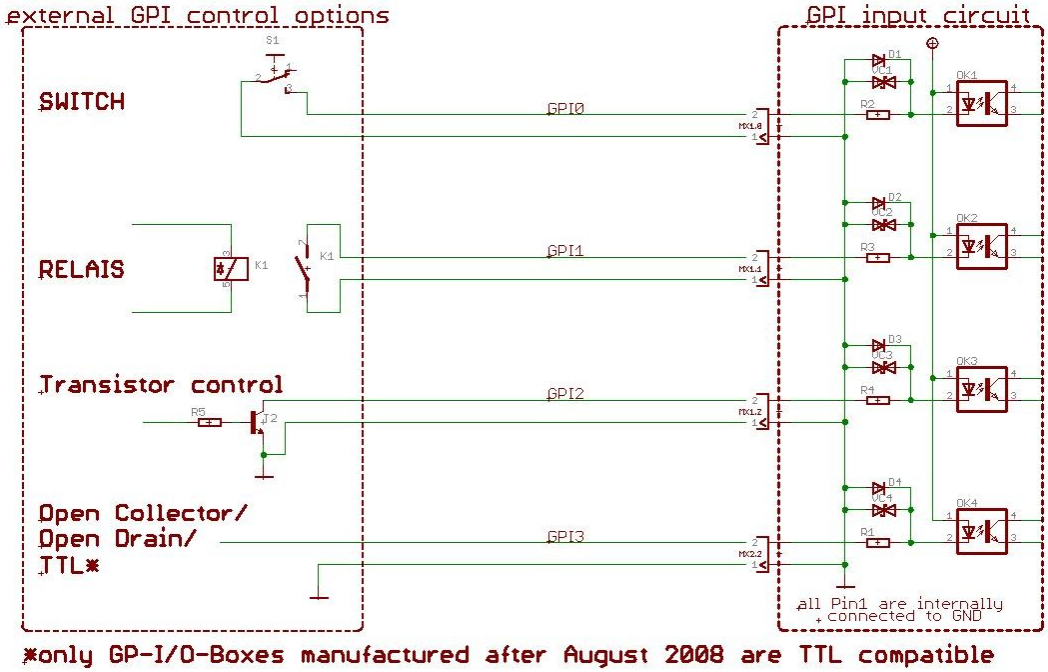
This Interface is a small signal interface only.

To avoid damage, do not exceed 12VDC/50mA for each relay-output.

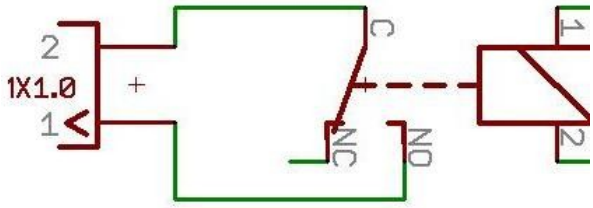
The galvanically isolated DC-TTL-Inputs are able to “set” a readable input by either shorting the input to ground, or, by supplying any 5VDC-voltage and undershooting 2,3VDC respective to ground.

We suggest using our separate stand-alone GPIO-unit for switching higher current or reading inputs up to 12VDC.

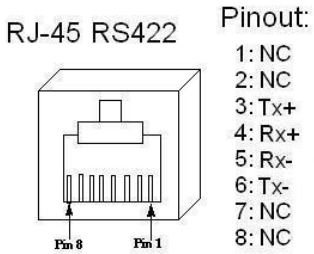
Possible GPI – Input wiring and control options:



GPO-contact-wiring "dry relay output":



8.3.3 External Serial Interface



Connector for data drive for external accessories:

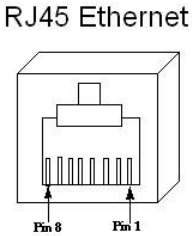
- 1 x RS422 via RJ45 connector
- 1 x RS422 (loop through) via RJ45 connector
- Serial Baud Rate will be configured automatically by the device to 115200 Baud.

RS422 is a differential signal transfer. Each Tx and each Rx line has both, therefore it is absolutely necessary that a twisted pair cable is. External accessory connections can easily be done by preconfigured standard shielded network cable (CAT5 or higher standard). To avoid potential difference between devices, shielded cable and shielded plugs with ground potential on both sides should be used. (Metalized plug-covers of RJ-45-plugs to touch ground-flange of RJ-45 connectors). Wrong wiring, wrong cables, wrong use of twisted pair and non-shielded traces lead to short working distances. Bad connection at one of the core in twisted pair traces may lead to a working unit, which seems to be working fine, but sometimes loses connection or showing strange behaviour. Always use a cable-tester before installing vsmGear-products to make sure, that there will be no unsuspected trouble with connected devices. Also check proper wiring of wire-shield-traces. We suggest RS422 traces via shielded twisted pair cable not to exceed 100m (328 feet) in total length.

8.3.4 Ethernet

Ethernet communication port to vsmStudio

It is understood that for proper operation each LBP panel is connected to an Ethernet-switch where the individual port of the switch is in need to be set to "Auto-Negotiation".



Pin	Signal	Color of a standard TIA-568A-shielded twisted pair patch cable (CAT5 or higher)
1	TX+	white/green

Pin	Signal	Color of a standard TIA-568A-shielded twisted pair patch cable (CAT5 or higher)
2	TX-	green
3	RX+	white/orange
4	NC	blue
5	NC	white/blue
6	RX-	orange
7	NC	white/brown
8	NC	brown

Notice for wiring:

NC: No connection; do not connect to any signal or supply.

Only use shielded CAT5 (or higher standard) -specified networkable. Refer to TIA-568A or TIA-568B for wiring.

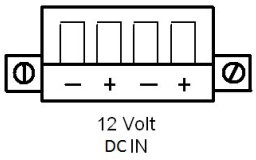
Do not use cable-traces longer than 100m (328ft) between the device and network-switch for 100BASE-T communication.

Make sure to keep to wiring standards and use shielded RJ45-plugs for shielded cable on both ends of the line.

8.4 Connectors (Accessories)

8.4.1 Power

Connector for the ENC17: 12 V DC-supply: 4-Pin connector (MC 1,5/ 4-STF-3,81) locked with two screws.



It is understood that if NOT using the original Power-Supply-Unit, you need to make sure that there is only one single 12V DC-supply with a maximum tolerance of 3% within the 12V. It has to be taken care, that the external supply uses a circuit-breaker, fuse or another kind of short-circuit-protection to never allow a current >5A @12VDC per device. Do NOT connect the device at reverse polarity at any time.

Connector for RF-ID-Tag-Reader for 12 V DC supply:

2-pin low voltage PSU connector 2.1mm

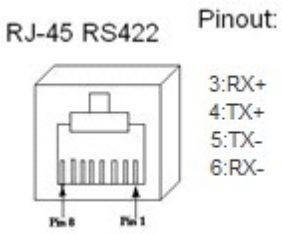
(Mounted on power-supply delivered with each RF-ID-Tag-Reader)

It is understood that if NOT using the original Power-Supply-Unit, you need to make sure that there is only one single 12V DC-supply with a maximum tolerance of 3% within the 12V. It has to be taken care, that the external supply uses a circuit-breaker, fuse or another kind of short-circuit-protection to never allow a current >5A @12VDC per device. Do NOT connect the device at reverse polarity at any time.

8.4.2 Rotary Encoder

Each rotary-encoder is a 50-click-per-360°-rotation encoder with three R/G/B LEDs. LEDs are controlled by the corresponding

8.4.3 Serial Interface



Connector for data drive for external accessories:

- 1 x RS422 via RJ45 connector
- Serial Baud Rate will be configured automatically by the master device (LBP panel) to 115200 Baud.

RS422 is a differential signal transfer. Each Tx and each Rx line has both signals, therefore it is absolutely necessary that a twisted pair cable is used. External accessory connections can easily be done by preconfigured standard shielded network cable (CAT5 or higher standard). To avoid potential difference between devices, shielded cable and shielded plugs with ground potential on both sides should be used. (Metalized plug-covers of RJ-45-plugs to touch ground-flange of RJ-45 connectors). Wrong wiring, wrong cables, wrong use of twisted pair and non-shielded traces lead to shorter working distances. Bad connection at one of the core in twisted pair traces may lead to a working unit, which seems to be working fine, but sometimes loses connection or showing strange behaviour. Always use a cable-tester before installing vsmGear-products to make sure, that there will be no unsuspected trouble with connected devices. Also check proper wiring of wire-shield-traces. We suggest RS422 traces via shielded twisted pair cable not to exceed 100m (328 feet) in total length.

9. Cleaning the LBP Panels

The best way to clean the button-front of LBP panels is to use a soft cloth and smooth window-cleaner-fluid. Do not expose the window-cleaner directly to the buttons, but to the cloth and then wipe softly over LBP panel-front.

Do not use polish remover, oil, alcoholic- or gasoline based cleaner for the buttons as this will destroy the button-glass.