vsm Push-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	0.22
2	2014-06-13	Initial release	0.22
4.0/1	2017-03-31	New Overview graphics & template	0.27

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 Push-Button Panels (PBP)** 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 Push-Button Panels (PBP) 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 **Lawo Push-Button Panel (PBP)** series is a cost-efficient line of push-button panels that may be used in conjunction with a **vsmStudio** control system.

Features:

- 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 PBP has two low power GPIs and GPOs.
- Every PBP 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.
- R/G backlight at the PBP’s allows the choice of multiple colours for button illumination.

4. Overview

PBP44

Number of buttons	44 rubber Buttons R/G-Backlight
Communication port	1xEthernet
Dimensions	483mm x 43,7mm x 41,6mm (WxHxD):1RU
Weight	approx. 0,7KG
Power Consumption	<7W @12VDC/0,58A 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

If the device has no physical link to the network, button 1 and 23 will blink fast alternately red. If link is established, blink frequency is reduced by half and the button will blink in yellow color.

All Lawo vsm 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	192.168.18.46
IP Mask	255.255.248.0
Mac Address	00-13-16-01-26-F2
Mode	100MBit-Full Duplex
Network Name	PBP44

Press the "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 (Server 1 – 4 depending on level of redundancy) and to assign Panel IDs go to the "Application" section. Button brightness is only controllable over the "Brightness" field in vsmDiscover.

Application	
Brightness[6%-100%]	49
Panel ID	1
Server 1	192.168.19.113
Server 2	192.168.19.114
Server 3	0.0.0.0
Server 4	0.0.0.0

The Location and Comment fields in the "Misc" section are 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	192.168.19.113
Current Secondary	0.0.0.0
Detection State	Online

Device	
Controls	44
Hardware ID	1
Hardware Revision	3
ID	1
Moniker	PBP44
Options	FFFF
Software ID	1
Software Version	22
Software Version CPLD	4

7. Technical Specifications

7.1 Status LEDs

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.

7.2 Buttons

Each PBP pushbutton has a button size of 12mm x 12mm.

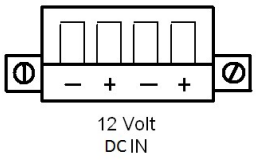
The backlight colour is R/G, so three colours can be displayed in different colour gradation.

The key stroke of the tactile buttons is about 2.0mm +/-0.1mm using an operation force of approximately 2.0N +/-0.8N. Button-spacing of PBP-panel is (X x Y) 19,05mm x 21,0mm.

7.3 Connectors

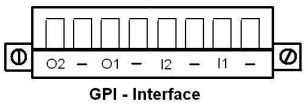
7.3.1 Power

Connector for 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.

7.3.2 GPI-Interface



GPI - Interface

Connectors for rear GPI-interface:

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

Separate plugs not included for standard PBP delivery.

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

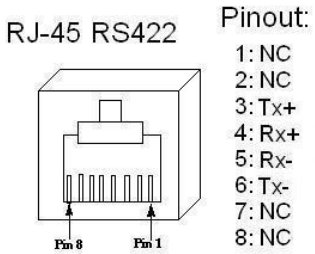
The GPI - connector is an 8-pin connector

(MC 1,5/ 8-STF-3,81). 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.

7.3.3 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.

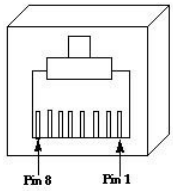
RS422 is a differential signal transfer. Each Tx and each Rx line has both, therefore it is absolutely necessary that a twisted pair cable is used. External accessory connections can easily be done by preconfigured standard shielded network cable (CAT5 or higher standard). To avoid potential difference 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 short working distances. Bad connection at one of the cores using twisted pair traces may lead to a working unit, which seems to be working fine, but sometimes loses connection or shows strange behaviour. Always use a cable-tester before installing vsmGear products to ensure that there will be no unsuspected connection issues with connected devices. Also check correct wiring of wire-shield-traces. We suggest RS422 traces via shielded twisted pair cable not to exceed 100m (328 feet) in total length.

7.3.4 Ethernet

Ethernet communication port to vsmStudio

It is understood that for proper operation each PBP panel is connected to an Ethernet-switch where the individual port of the switch is set to “Auto-Negotiation”.

RJ45 Ethernet



Pin	Signal	Color of a standard TIA-568A-shielded twisted pair patch cable (CAT5 or higher)
1	TX+	white/green
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 connected; 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 do proper wiring and use shielded RJ45-plugs for shielded cable on both ends of the line.

8. Cleaning the PBP Panels

The best way to clean the button-front of PBP 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 PBP panel-front.

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