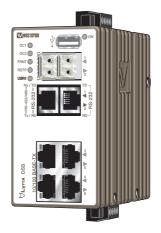
User Guide 6643-2220





Lynx DSSL108 / L208-F2G-S2



Industrial Ethernet 8-port Device Server Switch

Safety



Warning

Do not open connected unit. Hazardous voltage may occur within this unit when connected to power supply.

Note that this unit can be connected to two different power sources.

When this unit is operated at an ambient temperature above +55°C (+131°F), the External Surface of Equipment may exceed Touch Temperature Limit according to EN/IEC/UL 60950-1.

To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

For more information see General safety 100-5001.



Software tools

Related software tools are available in the folder software tools under technical support on the Westermo website.

License Information

This device contains public available software which is under the GPL license. For more information see legal.pdf included with all firmware releases. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. http://www.openssl.org

Legal information

The contents of this document are provided "as is". Except as required by applicable law, no warranties of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, are made in relation to the accuracy and reliability or contents of this document. Westermo reserves the right to revise this document or withdraw it at any time without prior notice.

Under no circumstances shall Westermo be responsible for any loss of data or income or any special, incidental, and consequential or indirect damages howsoever caused. More information about Westermo can be found at the following Internet address: http://www.westermo.com

Maintenance

No maintenance is required, as long as the unit is used as intended within the specified conditions.

Agency approvals and standards compliance

Туре	Approval / Compliance			
EMC	EN 61000-6-1, Immunity residential environments			
	EN 61000-6-2, Immunity industrial environments			
	EN 61000-6-3, Emission residential environments			
	EN 61000-6-4, Emission industrial environments			
	EN 55022 +A1, Emission IT equipment			
	EN 55024 +A1 + A2, Immunity IT equipment			
	FCC part 15 Class B			
	EN 50121-4, Railway signalling and telecommunications apparatus			
	IEC 62236-4, Railway signalling and telecommunications apparatus			
Safety	UL/IEC/EN 60950-1, IT equipment			
Marine	DNV Standard for Certification no. 2.4			

FCC Part 15.105 Notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- III Increase the separation between the equipment and receiver
- ## Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- **III** Consult the dealer or an experienced radio/TV technician for help.

Corrosive environment Notice:

This product has been successfully tested in a corrosion test according to *IEC 60068-2-60*, method 3. This means that the product meets the requirements to be placed in an environment classified as *ISA-S71.04* class *G3*.

Note! If the product is placed in a corrosive environment, it is important that all unused connector sockets are protected with a suitable plug in order to avoid corrosion attacks on the gold plated pins in connectors.

Declaration of Conformity



Declaration of conformity

The manufacturer Westermo Teleindustri AB

SE-640 40 Stora Sundby, Sweden

Herewith declares that the product(s)

Type of product	Model 1		
Ethernet device server switch	Lynx DSS	L*08-F2G-S2*	

is in conformity with the following EC directive(s).

No	Short name
2004/108/EC	Electromagnetic Compatibility (EMC)
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and
	electronic equipment (RoHS)

References of standards applied for this EC declaration of conformity.

No	Title	Issue
EN 61000-6-1	Electromagnetic compatibility – Immunity for residential environments	2007
EN 61000-6-2	Electromagnetic compatibility – Immunity for industrial environments	2005
EN 61000-6-3	Electromagnetic compatibility – Emission for residential environments	2007
EN 61000-6-4	Electromagnetic compatibility – Emission for industrial environments	2007
EN 55024	Information technology equipment - Immunity	1998 +A1:2001 +A2:2003
EN 55022	Information technology equipment - Emission	2006 +A1:2007
EN 50121-4	Railway applications - Electromagnetic compatibility Emission and immunity of the signalling and telecommunications apparatus	2006

13

The last two digits of the year in which the CE marking was affixed:

Signature

Pierre Öberg Technical Manager 18th Mars 2013

 Postadress/Postal address
 Tel.
 Telefatx
 Postgiro
 Bankgiro
 Corganio (Organio Introduction)
 Registered office

 S-64 04 Stora Sundby
 016-428000
 10f4-428001
 52 72 79-4
 5671-5550
 556361-2604
 Eskilstuna

 Sweden
 Int-46 16428000
 Int-46 16428001
 Int-46 16428001
 Int-46 16428001
 Int-46 16428001

¹ The first "**" in the model name can be any alphanumeric character, indicating software version. The second "**" in the model name can be any alphanumeric characters indicating customer specific models, or blank.

Product description

Status	Active	
Ports	6 x RJ-45, 10/100BaseT. 4 x SFP, 100/1000 Mbit/s. 2 x RJ-45, RS-232/422/485.	
Description	Managed Device Server Switch with routing functionality	
Warranty period	5 years	

Approvals				
Marine DNV Standard for Certification no. 2.4				
EMC (Electromagnetic Compatibility)				
EN 61000-6-1	Immunity residential environments			
EN 61000-6-2	Immunity industrial environments			
EN 61000-6-3	Emission residential environments			
EN 61000-6-4	Emission industrial environments			
EN 55022 +A1	Emission IT equipment			
EN 55024 + A1 + A2	Immunity IT equipment			
FCC part 15	Class B			
EN 50121-4	Railway signalling and telecommunications apparatus			
IEC 62236-4	Railway signalling and telecommunications apparatus			
EMC specifications				
EN 61000-4-2, ESD	Contact: ±6 kV Air: ±8 kV			
EN 61000-4-4, fast transients	Power port: ±2 kV Ethernet: ±2 kV Status out/Digital in: ±2 kV Serial ports: ±2 kV Enclosure: ±2 kV			
EN 61000-4-5, surge	Power port L-L: ±0.5 kV, 2 Ω, 18 μF L-E: ±2 kV, 42 Ω, 0.5 μF L-L: ±1 kV, 42 Ω, 0.5 μF L-E: ±2 kV, 12 Ω, 9 μF L-L: ±1 kV, 12 Ω, 9 μF			
	Ethernet L-E: ± 2 kV, 2Ω , 0.5 μ F Status out/Digital in L-E: ± 2 kV, 42 Ω , 0.5 μ F L-L: ± 1 kV, 42 Ω , 0.5 μ F RS-232 L-E: ± 2 kV, 2 Ω , 2 Ω , 2 Ω , 2 Ω			
EN 61000-4-8, power frequency magnetic field	L-E: ±2 kV, 42 Ω, 0.5 μF 300 A/m; 0, 16.7, 60 Hz 1000 A/m; 50 Hz			

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EN 61000-4-9,	300 A/m		
pulsed magnetic field			
EN 61000-4-3,	20 V/m @ (80 – 2700) MHz		
radiated RF immunity	1 kHz sine, 80% AM		
EN 61000-4-6,	Power port: 10 V, 80% AM, 1 kHz; (0.15 – 80) MHz		
conducted RF immunity	Ethernet: 10 V, 80% AM, 1 kHz; (0.15 – 80) MHz Ethernet: 10 V, 80% AM, 1 kHz; (0.15 – 80) MHz		
	Status out/Digital in: 10 V, 80% AM, 1 kHz; (0.15 – 80) MHz		
	Status out/Digital in: 10 V, 80% AM, 1 kHz; (0.15 – 80) MHz		
	Serial ports: 10 V, 80% AM, 1 kHz; (0.15 – 80) MHz		
	Earth port: 10 V, 80% AM, 1 kHz; (0.15 – 80) MHz		
EN 55022,	EN 55022/FCC Part 15/DNV 2.4, Class B / DNV bridge		
radiated RF emmision, FCC Part 15/ DNV 2.4			
EN 55022.	EN EE022/ECC Part 15/DNIV 2.4 Class B / DNIV huides		
conducted RF emmision,	EN 55022/FCC Part 15/DNV 2.4, Class B / DNV bridge		
conducted in chamber,			
DNV 2.4,	Standard compass (5.4°/H deviation) = 15 cm		
compass safe distance	Steering/standby steering/emergency compass		
	(18°/H deviation) = 10 cm		
Safety			
Safety	UL/IEC/EN 60950-1, IT equipment		
EN 60950-1,	Power port to all other ports: 1.5 kVrms, 50 Hz, 1 min		
dielectric strength	Ethernet ports to all other ports: 1.5 kVrms, 50 Hz, 1 min RS-232 port to all other ports: 1.5 kVrms, 50 Hz, 1 min		
	RS-422/485 port to all other ports: 1.5 kVrms, 50 Hz, 1 min		
Reliability prediction	, , , , , , , , , , , , , , , , , , , ,		
MTBF, operating	517 000 hours		
Service life, operating	10 years		
Climatic			
Temperature, operating	-40 to +70°C (-40 to +158°F)		
Temperature, storage	–50 to +85°C (–58 to +185°F)		
Humidity, operating	5 to 95 % relative humidity		
Humidity, storage	5 to 95 % relative humidity		
Enclosure			
Enclosure	Fire enclosure		
Dimensions (W x H x D)	52.5 x 100 x 101 mm		
Weight	0.7 kg		
Degree of protection	IP 40		
Cooling	Convection		
Mounting	Horizontal on 35 mm DIN-rail		

Mechanical				
IEC 60068-2-6.	IEC 60068-2-6,(sine), operating			
vibration	3 – 13.2 Hz: 1mm			
	13.2 – 100 Hz: 0.7 g			
	5.5 – 30 Hz: 1.5 g			
	30 – 50 Hz: 0.42 mm			
	50 – 500 Hz: 4.2 g			
	IEC 60068-2-64 (random), operating			
	5 – 20 Hz: 2 m²/s³, 20 – 2000 Hz: – 3 dB/oct			
IEC-60068-2-27, shock	Operating:			
12C-00000-2-27, SHOCK	30 g, 11 ms			
	100 g, 6 ms**			
IEC 60068-2-27, bump	Operating:			
	10 g, 11 ms			
Interface specifications, power				
Rated voltage	24 to 48 VDC			
Operating voltage	19 to 60 VDC			
Rated current	250 mA (380 mA) @ 24 VDC (with 500 mA USB load)			
	120 mA (188 mA) @ 48 VDC (with 500 mA USB load)			
Rated frequency	DC			
Inrush current	22.7·10-3 A²s @ 48 VDC			
Startup current*	2 x Rated current			
Polarity	Reverse polarity protected			
Redundant power input	Yes			
Isolation to	All other			
Connection	Detachable screw terminal			
Connector size	0.2 – 2.5 mm ² (AWG 24 – 12)			
Shielded cable	Not required			
* External supply current capability for p	roper start-up			
Interface specifications, 10/100B	aseTX			
Electrical specification	IEEE std 802.3. 2005 Edition			
Data rate	10 Mbit/s, 100 Mbit/s, manual or auto			
Duplex	Full or half, manual or auto			
Circuit type	TNV-1			
Transmission range	Up to 150 m with CAT5e cable or better*			
Isolation to	All other			
Connection	RJ-45, auto MDI/MDI-X			
Cabling	Shielded CAT5e or better is recommended			
Conductive housing	Yes			
Number of ports	4			
* Refer to Safety section.				

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Interface specifications, 100/1	000SFP		
Optical/Electrical specification	IEEE std 802.3. 2005 Edition		
Data rate	100 Mbit/s or 1000 Mbit/s transceivers supported		
Duplex	Full or Auto, depending on transceiver		
Transmission range	Depending on tranceiver		
Connection	SFP slot holding fibre transceiver or copper transceiver		
Number of ports	1 or 2		
Interface specifications, RS-23	32		
Electrical specification	EIA RS-232		
Data rate	300 bit/s - 115.2 kbit/s		
Data format	7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits		
Protocol	Transparent, optimised by packing algorithm		
Circuit type	SELV		
Transmission range	15 m / 49 ft		
Isolation to	All other		
Connection	RJ-45 according to EIA-561		
Shielded cable	Recommended		
Conductive housing	Yes		
Number of ports	1		
Interface specifications, RS-42	22/485		
Electrical specification	Configurable for EIA RS-232 or EIA RS-422/485		
Data rate	50 bit/s - 2 Mbit/s		
Data format	7 or 8 data bits, Odd, even or none parity, 1 or 2 stop bits (2 stop bits only when no parity is set)		
Circuit type	TNV-1		
Transmission range	Up to 1200 m / 0.74 mi, depending on data rate and cable type		
Isolation to	All other		
Connection	RJ-45 according to EIA-561		
Shielded cable	Not required, but recommended in railway installations close to the rails.*		
Conductive housing	Yes		
Number of ports	1		
* To minimise the risk of interference	a shielded cable is recommended when the cable is located inside 3 m		

^{*} To minimise the risk of interference, a shielded cable is recommended when the cable is located inside 3 m boundary or the cable is longer than 30 m and inside 10 m boundary to the rails and connected to this port.

Interface specifications, I/O relay output					
Maximum voltage / current	60 VDC / 80 mA				
Connect resistance	Max 30 Ω				
Isolation to	All other				
Connection	Detachable screw terminal				
Connector size	0.2 – 2.5 mm ² (AWG 24 – 12)				
Interface specifications, I/O Dig	gital output				
Maximum volt / current	60 VDC / 2 mA				
Voltage_levels	Logic one: >12V Logic zero: <1V				
Isolation to	All other				
Connection	Detachable screw terminal				
Connector size	0.2 – 2.5 mm ² (AWG 24 – 12)				
Interface specifications, USB					
Electrical specification	USB 2.0 host interface				
Data rate	Up to 12 Mbit/s (full-speed mode)				
Circuit type	SELV				
Maximum supply current	500 mA				
Connection	USB receptacle connector type A				
Interface specifications, console					
Electrical specification	LVTTL/LVCMOS-level				
Data rate	115.2 kbit/s				
Data format	8 data bits, no parity, 1 stop bit, no flow control				
Circuit type	SELV				
onnection 2.5 mm jack, use only Westermo cable 1211-2027					
Accessories					
Description	Art no				
Westermo console cable	1211-2027				
RJ45 to terminal block	1200-2490				
RJ45 to DB9 cable	1211-2210				

SFP Transceivers

Supported transceivers

Firmware prior to 4.4.0 accepts Westermo branded

transceivers only. From 4.5.0 other transceivers are accepted with a notice and the unit will no longer be UL approved. Temp. specifications are also depending on the used transeivers.

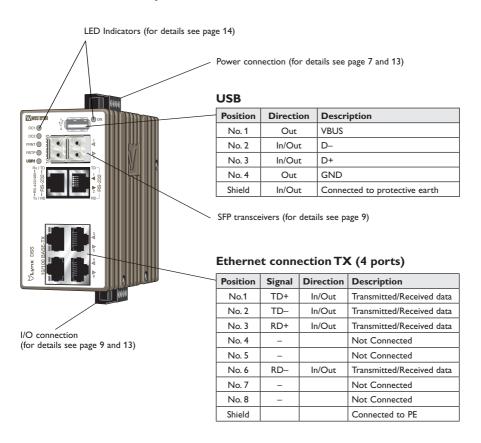
Note: To comply with UL60950-1 only UL recognized SFP transceivers should be used.

Deviations

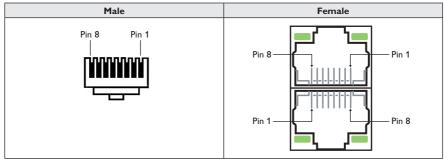
With copper transceiver 1100-0148 the specified operating temperature on Lynx is 0 to $+50^{\circ}$ C (32 to $+122^{\circ}$ F).

FRNT reconfiguration times can not be guaranteed with copper transceivers.

Location of interface ports and LED's



RJ-45 connector (Front view)



RS-422/485 (for more details see below)

No. 8

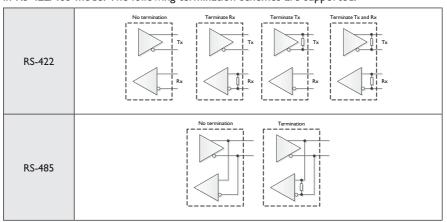
RTS

In

Position	Sig	gnal	Direction	Description	
	RS-422 (4-wire)	RS-485 (2-wire)			0000
No. 1	T+	T+/R+	Out/In	RS-422: Transmit RS-485: Transmit/Receive	Westerno ON
No. 2	T–	T-/R-	Out/In	RS-422: Transmit RS-485: Transmit/Receive	PRINT RESTPOND
No. 3	R-	-	In	RS-422: Receive	USRI 2
No. 4	-	-	-	Not used	R-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
No. 5	_	-	-	Not used	-RS-422/488 - RS-232 - NS-232 - NS-232
No. 6	R+	-	In	RS-422: Receive	Tx/RD RD
No. 7	-	-	-	Not used	
No. 8	-	-	-	Not used	
RS-232					CLynx DSS TOTIOG BASE: TOTIO
Position	Signal	Direction	Descrip	tion	
No. 1	DSR	Out	Data Set	Ready	1 8000
No. 2	DCD	Out	Data Ca	rrier Detect	
No. 3	DTR	In	Data Ter	minal Ready	
No. 4	SG	-	Signal Gr	ound, not chassis ground	
No. 5	RD	Out	Receive	Data	
No. 6	TD	In	Transmit	Data	
No. 7	CTS	Out	Clear To	Send	

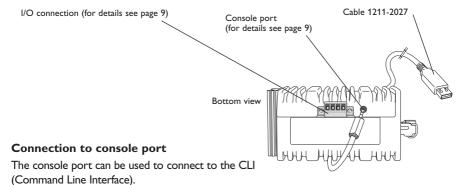
Lynx DSS is equipped with internal termination that is configurable through software in RS-422/485 mode. The following termination schemes are supported:

Request To Send



When the unit is powered-off or during reboot, any internal termination will be disconnected from the signal lines.

Note: Due to that the port is configurable for both RS-232 and RS-422/485, there are no fail-safe biasing available for RS-422/485 signals.

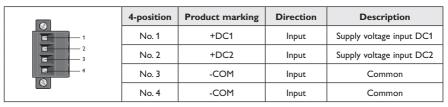


The following steps needs to be taken

- Connect the serial diagnostic cable to the console port (use only Westermo cable 1211-2027).
- 2. Connect cable to your computer (USB port, if drivers are needed they can be downloaded from our Web page).
- 3. Use a terminal emulator and connect with correct speed and format (115200, 8N1) to the assigned port.

For more information about the CLI, see the WeOS management guide.

Power connection



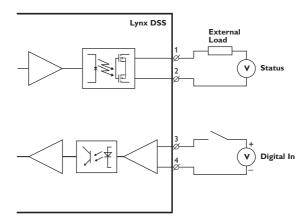
LynxDSS supports redundant power connection. The positive inputs are \pm DC1 and \pm DC2, the negative input for both supplies are \pm COM. Connect the primary voltage (e.g. \pm 24 VDC) to the \pm DC1 pin and return to one of the \pm COM pins on the power input.

I/O connection

	4-position	Product marking	Direction	Description
1—1—2—1—3—4—1—4—1—4—1—4—1—4—1—4—1—4—1—4—1—4—1	No. 1	Status +	Output	Alarm relay (status) contact
	No. 2	Status –	Output	Alarm relay (status) contact
	No. 3	Digital in +	Input	Digital in +
	No. 4	Digital in –	Input	Digital in –

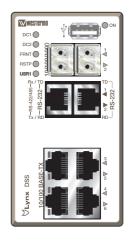
The Status output is a potential free, opto-isolated normally closed solid-state relay. This can be configured to monitor various alarm events within the Lynx DSS unit, see WeOS Management Guide. An external load in series with an external voltage source is required for proper functionality. For voltage/current ratings, see Interface Specification section.

The Digital in is an opto-isolated digital input which can be used to monitor external events. For voltage/current ratings, see Interface Specification section:



LED indicators

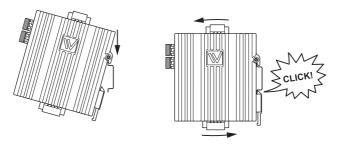
LED	Status	Description					
ON	OFF	Unit has no power.					
	GREEN	All OK, no alarm condition.					
	RED	Alarm condition, or until unit has started up. (Alarm conditions are configurable, see "WeOS Management Guide").					
	BLINK	Location indicator ("Here I am!"). Activated when connected to IPConfig Tool, or upon request from Web or CLI.					
DC1	OFF	Unit has no power.					
	GREEN	Power OK on DC1.					
	RED	Power failure on +DC1.					
DC2	OFF	Unit has no power.					
	GREEN	Power OK on DC2.					
	RED	Power failure on +DC2.					
FRNT	OFF	FRNT disabled.					
	GREEN	FRNT OK.					
	RED	FRNT Error.					
	BLINK	Unit configured as FRNT Focal Point.					
RSTP	OFF	RSTP disabled.					
	GREEN	RSTP enabled.					
	BLINK	Unit elected as RSTP/STP root switch.					
USR1	OFF	Configurable, see WeOS Management Guide.					
	GREEN						
	RED						
Rx/TD,TD	OFF	No serial data received.					
	GREEN FLASH	Serial data received.					
Tx/RD, RD	OFF	No serial data transmitted.					
	GREEN FLASH	Serial data transmitted.					
1 to 6	OFF	No Link.					
	GREEN	Link established.					
	GREEN FLASH	Data traffic indication.					
	YELLOW	Port alarm and no link. Or if FRNT or RSTP mode, port is blocked.					



Mounting

This unit should be mounted on 35 mm DIN-rail, which is horizontally mounted inside an apparatus cabinet or similar. It is recommended that the DIN-rail is connected to ground. Snap on mounting, see figure.

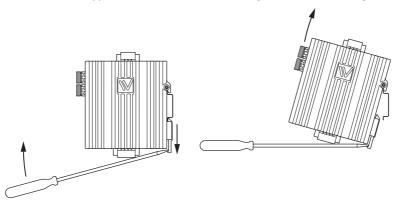
Mounting Lynx with integrated DIN-clip:



Removal

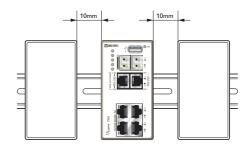
Removing Lynx with integrated DIN-clip:

Press down the support at the back of the unit using a screwdriver. See figure.



Cooling

This unit uses convection cooling. To avoid obstructing the airflow around the unit, use the following spacing rules. Minimum spacing 25 mm (1.0 inch) above / below and 10 mm (0.4 inches) left / right the unit. Spacing is recommended for the use of unit in full operating temperature range and service life.



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Getting Started

This product runs Westermo Operating System (WeOS) which provides several management tools that can be used for configuration of the unit.

IPConfig tool

This is a custom Westermo tool used for discovery of attached Westermo units. **Note!** Version of IP Config tool must be 10.4.0 or higher.

Web

Configuration of the unit using the web browser.

CLI

Configuration of the unit via the Command Line Interface.

Username: admin
Password: westermo

If the computer is located in the same subnet as the switch you can easily use a web browser to configure the unit. Within the web you can configure most of the available functions.

For advanced network settings and more diagnostic information, please use the CLI. Detailed documentation is available in the chapter "The Command Line Management Tool" in the WeOS management guide.

Factory default IP address: 192.168.2.200

Netmask: 255.255.255.0 Gateway: Disabled

Note! If you are not sure about the subnet – consult your network administrator.

Configuration

Configure the unit via Web browser

The unit can easily be configured via a Web browser.

Open the link http://192.168.2.200 in your web browser, and you will be prompted with a Login screen, where the default settings for Username and Password are:

Username: admin Password: westermo

Once you have logged in, you can use the extensive integrated help function describing all configuration options. Two common task when configuring a new switch is to assign appropriate IP settings, and to change the password of the admin account.

The password can be up to 64 characters long, and should consist of printable ASCII characters (ASCII 33-126); 'Space' is not a valid password character.

Referring documents

Туре	Description	Document number
Management Guide	Westermo OS management guide	6101-3201

Factory default on Lynx DSS

It is possible to set the unit to factory default settings by using two straight standard Ethernet RJ-45 cables.

- 1. Power off the switch and disconnect all Ethernet cables (copper and fibre).
- 2. Connect one Ethernet cable between Ethernet ports 3 and 6, and the other between Ethernet ports 4 and 5.
 - The ports need to be connected directly by an Ethernet cable, i.e., not via a hub or switch. Use a straight cable not a cross-over cable when connecting the ports.
- 3. Power on the unit.
- 4. Wait for the unit to start up. Control that the ON LED is flashing red.

The ON LED flashing indicates that the unit is now ready to be reset to factory default. You now have the choice to go ahead with the factory reset, or to skip factory reset and boot as normal.

- · Go ahead with factory reset:
 - Acknowledge that you wish to conduct the factory reset by unplugging the Ethernet cables. The ON LED will stop flashing.
 - This initiates the factory reset process*, and after approximately 1 minute the unit will restart with factory default settings. When the switch has booted up, the ON LED will show a green light, and is now ready to use.
- Skip the factory reset:
 - To skip the factory reset process, just wait for approximately 30 seconds (after the ON LED starts flashing RED) without unplugging the Ethernet cables. The switch will conduct a normal boot with the existing settings.
- * **Note** Do not power off the unit while the factory reset process is in progress.



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Other Offices



For complete contact information, please visit our website at www.westermo.com/contact or scan the QR code