

SG4-DONGLE

Ethernet Adaptor for SG4 EXTENDED Light Curtain Series

INSTRUCTION MANUAL

Before connecting or disconnecting SG4-DONGLE to SG4 Extended light curtain please make sure to power off both of them.
Connection or disconnection with powered products can damage the dongle or light curtain. The dongle exchanges the configuration with light curtain at system start up: if SG4-DONGLE is connected when the light curtain is already powered and initialized the system will not work correctly.

SG4E: Safety Light Curtain of SG4 Extended series.
SG Extended GUI: Graphic User Interface for computer for SG4 Extended Series Light Curtains.

CLONING

SG4-DONGLE can download SG4E ACM configuration from SG4E then upload it to other Light Curtains **with same product code.**
That's for backup purposes in case of Light Curtain substitution after damage or **series configuration of several ESPEs with the same final function.**

Step 1: Configuration Backup

Connect SG4-DONGLE to source SG4E as shown in Connection section of this manual.
Hold ▼ **button** till d indication appears on display.
Backup is done when DL led stops blinking (Fig. 1)

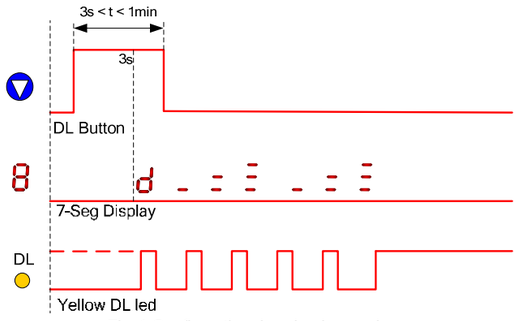


Fig. 1 Configuration download procedure

Step 2: Configuration Restore

Connect SG4-DONGLE to destination SG4E as shown in Connection section of this manual.
Important: destination SG4E must have the same product code of source one.

Hold ▲ **button** till U indication appears on display.
Restore is done when UL led stops blinking (Fig. 2)

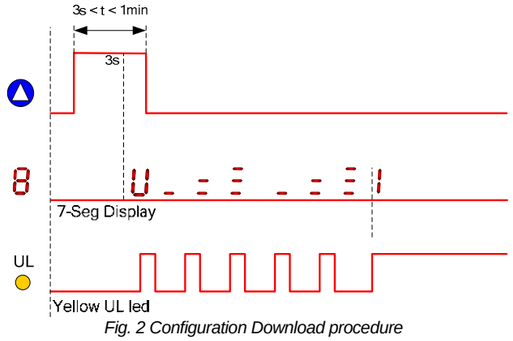


Fig. 2 Configuration Download procedure

After a successful upload SG4-DONGLE stores a configuration report and shows the number of saved report.
A maximum of ten consecutive upload are allowed, then user must download configuration reports by means of SG4 User Interface.
After upload, configuration remains stored in SG4-DONGLE: it's possible to upload the same configuration to other light curtains (a new report is generated for each upload).

Step 3: Download report and check Light Curtain configuration

Connect SG4-DONGLE to **Ethernet and Power** as shown in Connection section of this manual (cfr. SG4-DONGLE Standalone Connection).
In SG Extended GUI Download all reports stored in SG4-DONGLE



Each configuration reports shows the **Light Curtain Serial Number** which the corresponding configuration has been uploaded to and all the configuration parameters.

Carefully check all the configured Light Curtains are operating according to downloaded reports before restoring normal plant operation.

To erase not relevant or already downloaded Safety Reports hold ▲ **button** till E indication appears on display.

OFFLINE CONFIGURATION

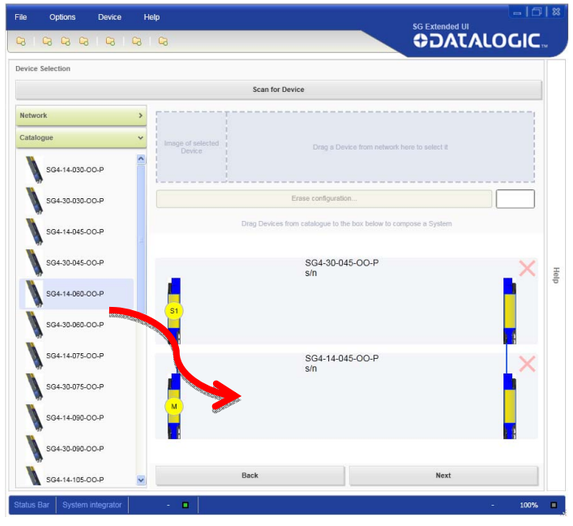
SG4-DONGLE can store SG4E ACM configuration from **SG Extended GUI** then upload it to one or more SG4E Light Curtains compatibles with configuration parameters.
That's useful for configuration of one or more SG4E Light Curtains when no Ethernet connection is available on controlled machinery.

Step 1: Store ACM configuration on SG4-DONGLE

Connect SG4-DONGLE to **Ethernet and Power** as shown in Connection section of this manual (cfr. SG4-DONGLE Standalone Connection).
In SG Extended GUI Choose "Safety System Configuration" to begin off-line configuration.



Compose an SG4E System by dragging devices from catalogue with the proper product code. (up to a 3 unit cascade configuration can be stored on SG4-DONGLE).



Important: be sure to select the right SG4E product code according to the device the configuration is going to.
A wrong selection will lead to a failure in device upload.

Step 2: Upload configuration to SG4 Extended

Connect SG4-DONGLE to destination SG4E as shown in Connection section of this manual.
Hold ▲ **button** till U indication appears on display.

After a successful upload SG4-DONGLE stores a configuration report.
A maximum of ten consecutive upload are allowed, then user must download configuration reports by means of SG4 user interface.

After upload, configuration remains stored in SG4-DONGLE: it's possible to upload the same configuration to other light curtains (a new report is generated for each upload).

Step 3: Download report and check Light Curtain configuration

Connect SG4-DONGLE to **Ethernet and Power** as shown in Connection section of this manual (cfr. SG4-DONGLE Standalone Connection).
In SG4 Download all reports stored in SG4-DONGLE

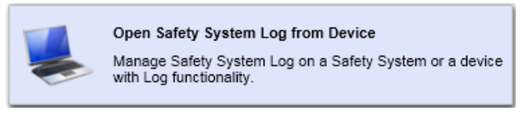


Each configuration reports shows the **Light Curtain Serial Number** which the corresponding configuration has been uploaded to and all the configuration parameters.

Carefully check all the configured Light Curtains are operating according to downloaded reports before restoring normal plant operation.

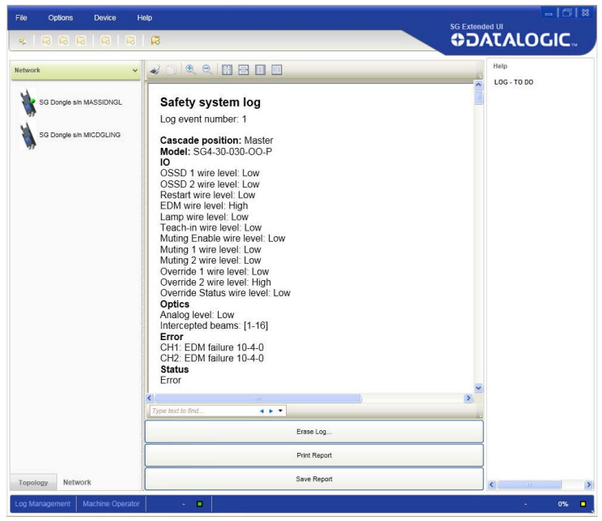
ERROR LOGGING

When connected to an SG4E System, SG4-DONGLE can log light curtain errors: detailed error information is saved on SG4-DONGLE memory that can be retrieved with the help of SG Extended GUI. That's useful for diagnostic purposes on randomic light curtains lockout.
Only ACM configured SG4E Systems can be logged.
SG4-DONGLE saves one log item each time the connected SG4E System locks into a noncritical Failure Lockout. Maximum number of Log items depends from cascade topology: 7 items for 3 unit cascades, 11 items for 2 unit cascades, 23 items for single unit cascade.
When SG4-DONGLE is moved from one SG4E System to a different one actual log is erased and a new log initialized. Same happens after a change of SG4E System configuration.
Connect SG4-DONGLE to **Ethernet and Power** as shown in Connection section of this manual (cfr. SG4-DONGLE Standalone Connection).
In SG Extended GUI Choose "Open Safety System Log form Device" to download and visualize all Logs stored in SG4-DONGLE.



Select SG4-DONGLE device to visualize the contained "Safety system log".
A Safety system log contains

- A Safety system report with detailed configuration of loggeg SG4E System
- One or more log item with detailed error information.



ADVANCED USER INTERFACE

When connected to an SG4E Light Curtain in operations, SG4-DONGLE shows detailed light curtain status information on 7-seg display.
See "Diagnostics" Chapter of SG4E Manual for more details about user interface messages.

FAILURE MESSAGGES	
F0	Failure on OSSDs
F1	Failure on Microprocessors
F6	Failure on Optics
F8	Failure on EDM
FA	Failure on Restart
FC	Communication Failure
FP	Failure on BCM configuration
FA	Failure on ACM configuration
FL	Failure on Muting Lamp

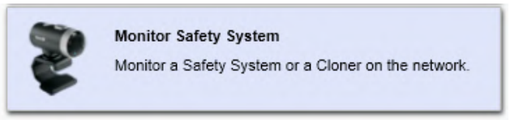
STATUS MESSAGGES	
A	Light curtain in Alignment Mode, Correct Alignment
U	Light curtain in Alignment Mode, Not Aligned
U2	Light curtain in Alignment Mode, last beam not aligned
U1	Light curtain in Alignment Mode, first beam not aligned
UA	Light curtain in Alignment Mode, intermediate beam not aligned
I	Light curtain in Interlock, activate RESTART line
AC	Advanced Configuration from SG Extended GUI running
H8	Muting function active
E8	Light curtain is ready to accept override request
O	Override function active
S3	Wrong input signal sequence on override request
S6	Blanking zone constraints not respected
B8	Blanking function active

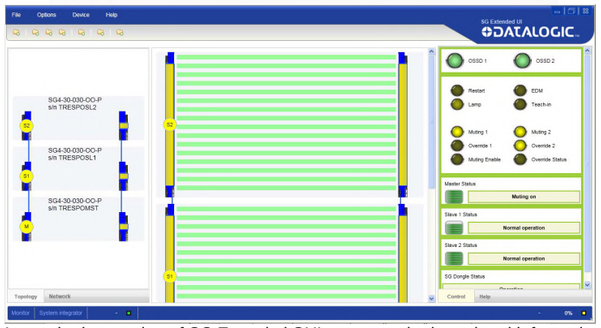
ON-LINE MONITORING AND CONFIGURATION

When connected to both SG4E Light Curtain in operations and Ethernet network, SG4-DONGLE allows SG4 GUI to directly connect SG4E Light Curtains.
Both single unit and cascade SG4E systems can be monitored and configured over Ethernet.
See Connection section of this manual for correct connection of SG4-DONGLE and SG4E Light Curtain.

Monitoring

In SG Extended GUI Choose “Monitor Safety System” to begin monitoring an SG4E System with an SG4-DONGLE connected.





In monitoring section of SG Extended GUI user can obtain updated information about:

- Connected cascade topology
- All beam status
- Alignment level
- OSSDs status
- SG4E Inputs status
- SG4E Outputs status
- SG4E Working Mode (with detailed error information)
- SG4-DONGLE Status

Monitoring is particularly useful for diagnosis and resolution of Light Curtain problems.

Configuration

In SG Extended GUI Choose “Safety System Configuration” to begin on-line configuration of connected SG4E.

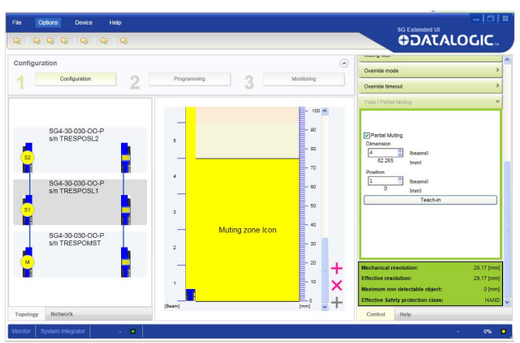


After device selection follow guided “1-2-3” Configuration Steps to:

1) Select all configuration parameters

2) Write new configuration on Light Curtain and obtain the “Safety System Configuration Report” required to test new configuration on Light Curtain.

3) Monitor Light Curtain operation before and after configuration.



Refer to SG4E User Manual and SG Extended GUI contextual help for further details about configuration procedure and parameters selection.

Refer to SG4E User Manual for all safety information and detailed on-line light curtain configuration procedure.

CONNECTION

Before connecting or disconnecting SG4-DONGLE to SG4E light curtain please make sure to power off both of them. Connection or disconnection with powered products can damage the dongle or light curtain. The dongle exchanges the configuration with light curtain at system start up: If SG4-DONGLE is connected when the light curtain is already powered and initialized the system will not work correctly.

Connection on Light Curtain Head

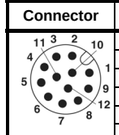
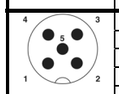
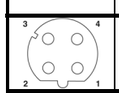
(Advanced user interface, cloning online monitoring and configuration)



Fig. 3 Connection on Light Curtain Head

SG4-DONGLE can be connected to Light Curtain Head Main connettor:

- Remove white plastic protective cap from SG4E main connector
- Insert SG4-DONGLE as shown in Fig. 3
- Fasten SG4-DONGLE screws
- Connect M12 12 Pole cable to SG4-DONGLE
- Connect M12 5 Pole muting cable to SG4-DONGLE if muting is used
- Connect 4 pole Ethernet cable if SG Extended GUI connection is used
- **Leave black caps on all unused connectors and assure they’re tightly fastened**

Connector	Pin (color)	Muting	Blanking
	1 (brown)	24V	24V
	2 (blue)	0V	0V
	3 (white)	RESET/RESTART	RESET/RESTART
	4 (green)	OVERRIDE 1	TOLERANCE
	5 (pink)	OSSD2	OSSD2
	6 (yellow)	EDM	EDM
	7 (black)	MUTING DISABLE	TEACH IN
	8 (grey)	OSSD1	OSSD1
	9 (red)	OVERRIDE 2	N.C.
	10 (violet)	MUTING LAMP	BLANKING LAMP
	11 (grey-pink)	OVERRIDE STATUS	N.C.
	12 (red-blue)	EARTH	EARTH
	1 (brown)	24V – Out	Not used – leave black cap on!
	2 (white)	MUTING2	
	3 (blue)	0V – Out	
	4 (black)	MUTING1	
	5 (grey)	N.C.	
	**Ethernet Connector** Use Standard M12 D-coded Ethernet cable Leave black cap on when not used.		

Connection on Light Curtain Tail

(Advanced user interface, cloning online monitoring and configuration)

SG4-DONGLE can be connected to Light Curtain tail back connettor:

- Remove (unscrew) black terminator cap from SG4E back connector.
- Insert SG4-DONGLE as shown in Fig. 4
- Fasten SG4-DONGLE screws
- Connect 4 pole Ethernet cable if SG Extended GUI connection is used
- **Leave black caps on all unused connectors and assure they’re tightly fastened.**

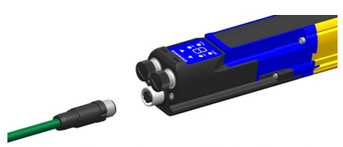


Fig. 4 Connection on Light Curtain Tail

Connection on Cascade System

On SG Extended GUI Cascade systems SG4-DONGLE can be connected either on **Master light curtain head** (as in Fig. 3) or on **last slave unit tail** (as in Fig. 4)

Stand-alone SG4-DONGLE Connection

(offline configuration, report download, log download)

- Connect M12 12 Pole cable to SG4-DONGLE
- Connect 4 pole Ethernet cable if SG Extended GUI connection is used
- **Standalone SG4-DONGLE is not IP 65 compliant**



Fig. 5 Stand-alone connection

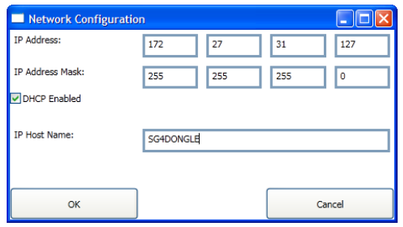
TCP/IP CONFIGURATION

SG4-DONGLE has DHCP client enabled by default.
Then it’s usually sufficient to connect SG4-DONGLE to the plant network for SG Extended GUI to be able to connect.
If connecting to a single PC outside a network configure the TCP/IP parameters of the pc to match the following:

IP: 172.27.101.210

Netmask: 255.255.0.0

If necessary it’s possible to change SG4-DONGLE Network Configuration from SG Extended GUI in menu **Device -> Setting** after connecting SG4-DONGLE.



USER INTERFACE



	STATUS	INFORMATION
ETH	●	SG4-DONGLE connected to Ethernet
	●	Ethernet connection not available
LINK	●	SG4-DONGLE connected to SG Extended GUI
	●	SG Extended GUI not connected
UL	●	No report in SG4-DONGLE memory
	☀	Configuration Upload to Light Curtain in progress
	●	One or more Safety Report stored in SG4-DONGLE.
DL	●	No downloaded configuration in SG4-DONGLE memory
	☀	Configuration Download from Light Curtain in progress
	●	Downloaded configuration stored in SG4-DONGLE memory, ready for Upload.
▲		Press for more than 1.5s (U appears) to upload configuration stored in SG4-DONGLE. Press for more than 4s (E appears) to erase Safety Reports in SG4-DONGLE memory.
▼		Press for more than 1.5s (d appears) to download configuration from Light Curtain to SG4-DONGLE.

SG4-DONGLE FAILURE MESSAGGES	
F b C	Light Curtain Configuration Backup Failure
F r C	Light Curtain Configuration Restore Failure, check configuration on SG4-DONGLE is compatible with connected SG4E System.
F b L	Light Curtain Configuration Backup Failure on Log Initalization
F F	Report Repository Full, download reports in SG Extended GUI.
F 4	Failure on SG4-DONGLE Factory Setting, contact Datalogic
F 5	Failure on TCP/IP Configuration, default restored
F 6	Failure on Light Curtain Backup Repository, default restored.
F 7	Failure on Report Repository, default restored.
F 8	Failure on Log Repository, default restored

TECHNICAL DATA

ELECTRICAL DATA	
Power supply (Vdd):	24 Vdc ± 20%
Unit current draw	0.1 A
Max distributed current	1.7A
Connections:	M12 12 pole / M12 5 pole M12 ETH 4 pole 18 (2x9) pole connector to Light Curtain
Cables length (for power supply):	50 m. max

MECHANICAL AND ENVIRONMENTAL DATA	
Operating temperature:	-0…+ 55 °C
Storage temperature:	- 25…+ 70 °C
Humidity:	15…95 % (no condensation)
Mechanical protection:	IP 65 (EN 60529)
Vibrations:	Width 0.35 mm Frequency 10 … 55 Hz 20 sweep per axis, 1octave/min (EN 60068-2-6)
Shock resistance:	16 ms (10 G) 1,000 shocks per axis (EN 60068-2-29)
Housing material:	NANYA PBT 1400 G3

Models versions compatibility

Starting from release 1.3.0 of SG Extended GUI, firmware version 6.2.0 of SG4-DONGLE, and firmware version 6.1.0 of SG4 EXTENDED light curtain, an improved configuration protection mechanism has been implemented by means of a device embedded password.
For combinations of GUI, SG4-DONGLE and SG4 EXTENDED with different versions of release or firmware, please check the following compatibility table.

SG EXTENDED GUI Release	SG4 DONGLE Firmware	SG4 EXTENDED Firmware	
R < 1.0.3	-	-	Please update to last version of SG EXTENDED GUI, available for free at www.datalogic.com
R ≥ 1.0.3	Fw < 6.2.0	Fw < 6.1.0	During on-line or off-line configuration, system will request a GUI password but not a device embedded password.
R ≥ 1.0.3	Fw < 6.2.0	Fw ≥ 6.1.0	During on-line configuration a device embedded password will be requested. Off-line configuration is not possible with this combination: SG4-DONGLE with Fw ≥ 6.2.0 is needed.
R ≥ 1.0.3	Fw ≥ 6.2.0	Fw < 6.1.0	During on-line configuration system will request a GUI password but not a device embedded password. During offline configuration, a password will be requested to store the configuration on SG4-DONGLE, but not transferred to the SG4 EXTENDED.
R ≥ 1.0.3	Fw ≥ 6.2.0	Fw ≥ 6.1.0	System will always request a device embedded password for configuration. It is also possible to input an empty password.

NOTE: SG4-DONGLE with Fw version ≥ 6.2.0 reports Fw version on product label.
Otherwise SG4 DONGLE with Fw version < 6.2.0 doesn’t report this information on product label.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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Helpful links at www.datalogic.com: **Contact Us, Terms and Conditions, Support**.

The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

Under current Italian and European laws, Datalogic is not obliged to take care of product disposal at the end of its life. Datalogic recommends disposing of the product in compliance with local laws or contacting authorised waste collection centres.

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