DATALOGIC™

DataVS1
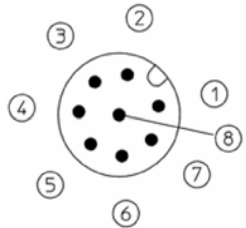### *Vision sensor*

Quick guide

DESCRIPTION

The DataVS1 series of vision sensors offers the easiest way to solve the most common machine vision applications.

– No PC needed
– 3.5'' LCD colour display configurator
– 640x480 image sensor
– Compact IP54 housing
– Red light LED illuminator
– Selectable lens
– Focus knob
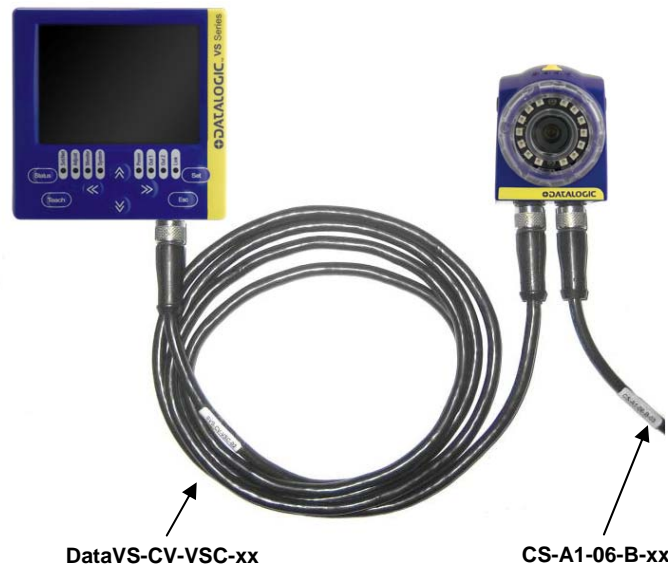– Standard M12 connectors

ELECTRICAL CONNECTIONS

M12 8 poles
(VSC connection)

pin 1: ethernet TX+
pin 2: ethernet RX+
pin 3: ethernet RX-
pin 4: Not used
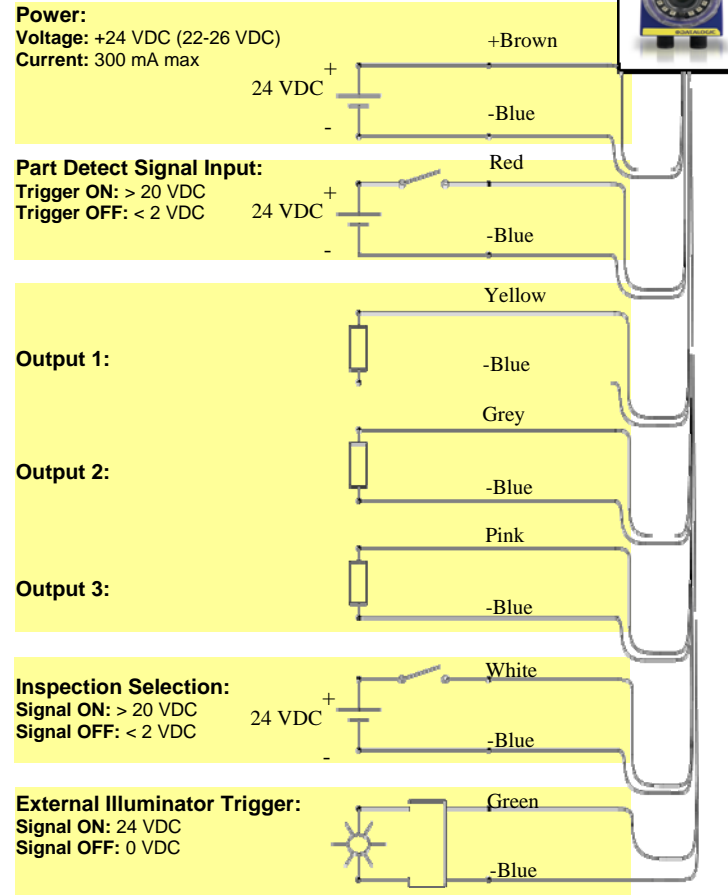pin 5: 24 Vdc
pin 6: Not used
pin 7: ethernet TX-
pin 8: GROUND

M12 8 poles
(power and I/O)

pin 1: white : digital input 1
pin 2: brown : 24 Vdc
pin 3: green : STROBE for ext. illuminator
pin 4: yellow : output 1
pin 5: grey : output 2
pin 6: pink : output 3
pin 7: blue : GROUND
pin 8: red : external trigger

DataVS-CV-VSC-xx   **CS-A1-06-B-xx**

HARDWARE CONNECTIONS

M12 8 Poles (Power and I/O)

Power:
Voltage: +24 VDC (22-26 VDC)
Current: 300 mA max
24 VDC   +Brown
-Blue

Part Detect Signal Input:
Trigger ON: > 20 VDC
Trigger OFF: < 2 VDC
24 VDC   Red
-Blue

Output 1:   Yellow
-Blue

Output 2:   Grey
-Blue

Output 3:   Pink
-Blue

Inspection Selection:
Signal ON: > 20 VDC
Signal OFF: < 2 VDC
24 VDC   White
-Blue

External Illuminator Trigger:
Signal ON: 24 VDC
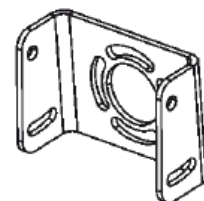**Signal OFF:** 0 VDC
Green
-Blue

DataVS1 MOUNTING

The DataVS1 sensor can be installed in many different ways.
A set of fixing accessories and brackets is available in the Datalogic catalogue. For example:
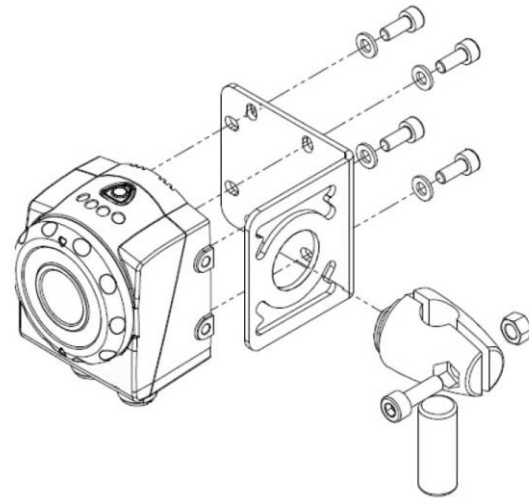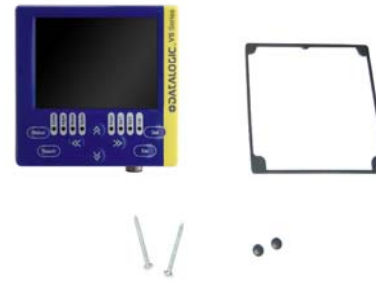

Mounting Kit

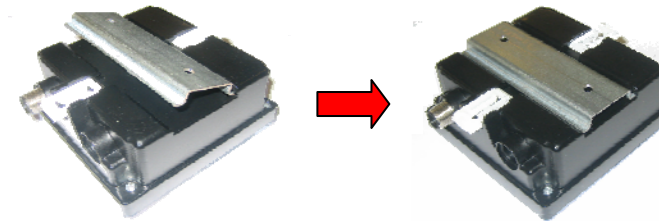U-shaped fixing bracket

VSC MOUNTING

All the accessories for VSC mounting are included in the package. The VSC unit can be installed on a DIN rail or on a panel.
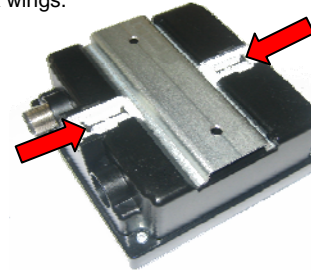
DIN RAIL MOUNTING

Locking clips

DIN Rail groove

Wedge the VSC unit in the DIN rail. First set the upper part of the monitor and then press down the lower part.
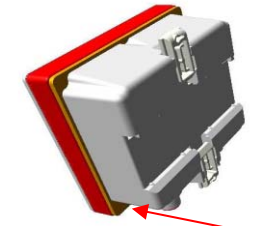

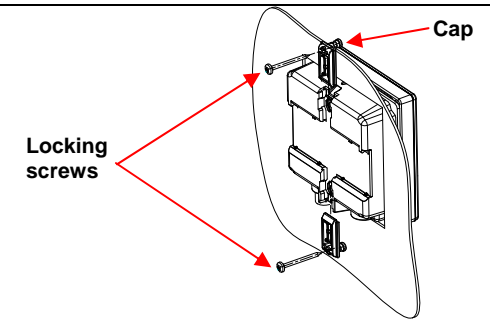When the VSC unit has been properly positioned on the DIN rail, fix it using the two white lock wings.

PANEL MOUNTING

First, place the rubber seal around the VSC unit.

Rubber seal

Then fix the monitor on the panel using the two lock screws and the two black caps.

Cap

Locking screws

INDICATORS

From left to right

1. Power, green;
2. Digital output 2, yellow;
3. Digital output 1, yellow;
4. VSC connection status, green.

1. Setting mode, green;
2. Adjust mode, green;
3. Monitor mode, green;
4. Main menu, green;
5. Power, green;
6. Digital output 1, yellow;
7. Digital output 2, yellow;
8. Sensor connection status, green.

OPERATING DISTANCE PANEL

Operating distance(mm)	DataVS1-16-DC-S	DataVS1-12-DC-S	DataVS1-08-DC-x	DataVS1-06-DC-S
50	-	17 x 12	25 x 20	42 x 30
80	-	25 x 20	40 x 30	60 x 41
110	-	33 x 25	55 x 40	80 x 55
140	31 x 24	45 x 35	70 x 50	98 x 69
170	39 x 29	53 x 38	85 x 60	118 x 83
200	46 x 34	60 x 50	100 x 70	138 x 92
300	70 x 53	90 x 65	145 x 103	201 x 140
400	94 x 71	121 x 82	186 x 132	265 x 189
500	118 x 89	150 x 110	236 x 167	330 x 232
600	143 x 107	185 x 130	282 x 232	385 x 270

TECHNICAL DATA

|	
Supply voltage:	24 VDC ± 10%
Ripple voltage:	1 Vpp max with illuminator 2 Vpp max without illuminator
Consumption (DataVS1 + VSC): *(excluding output current and illuminator)*	200 mA @ 24 VDC
Consumption with illuminator: *(depends on how long illuminator stays on)*	300 mA @ 24 VDC
Outputs:	3 PNP outputs (short circuit protection)
VSC connection:	M12 8-poles A-code
Interface for external illuminator:	Strobe signal (24 V PNP N.O.)
Output current:	100 mA max
Output saturation voltage:	< 2 V
Optics:	Integrated
Resolution:	640 × 480 (VGA)
Dimensions:	69.8 × 51.5 × 40 mm (sensor) 96 x 96 x 39 mm (configurator)
Indicators:	4+8 LED + 3.5'' LCD colour display
Setup:	VSC configurator
Data retention:	Non-volatile FLASH memory
Operating temperature:	-10 °C … +55 °C
Storage temperature:	-25 °C … +70 °C
Vibration:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shocks for every axis (EN60068-2-27)
Housing material:	Aluminium alloy / ABS
Mechanical protection:	IP50 (DataVS1) / IP40 (VSC)
Connections:	2 x M12 8-poles A-code
Weight:	125 g (DataVS1) / 170 g (VSC)

VSC configurator – Getting started

DataVS1 sensor requires a preliminary setting, that is obtained in a few steps using the external VSC configurator.

PUSH-BUTTONS	
Status	Go to next configuration step
Teach	Save the settings
	Acquire a new reference image
Set	Confirm current selection
Esc	Quit without saving
	Go back to previous configuration step
Arrows	Move the selection
	Move/Resize Region Of Interest (ROI)
	Change parameter/threshold value
	Change monitor mode

i. Inspection tool selection

After connecting the VSC to the sensor, the user has to choose the inspection tool to use. There are 7 different control types available: brightness, contrast, OCV, pattern match, position, width and edge count (see also the Tool Table). Use the ARROW buttons to choose the tool and then press SET to confirm the selection.
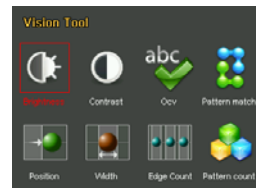
ii. Camera setting

Once selected the desired inspection tool, the user has to modify the camera parameters in order to get a good quality image. The focus can be adjusted directly on the sensor by turning the focus knob on the front. All the other parameters, instead, can be modified from the camera panel (select *Camera* with the ARROW buttons and then press SET).

In the *Camera* menu the user can switch the internal and the external illuminators on or off, increase or decrease the exposure time and the gain and lastly invert the greyscale values.

iii. ROI definition

Each type of control is based on the definition of a Region Of Interest (ROI). This means that the user has to define the area in which there is the particular to inspect. The ROI can be moved from the *Move ROI* panel by using the ARROW buttons. For the pattern match tool, there are two different ROIs that must be set (one is the template and the other one is the research area). The user can switch from a ROI to another by simply pressing the SET button. The ROI can be also resized. This can be done from the *Resize ROI* panel using the ARROW buttons. Again, for pattern match tool both the ROIs can be resized.

iv. Reference image acquisition

In order to acquire a new reference image, the user can press the TEACH button. Please consider that after changes in ROI size/position or camera/illuminator settings a new reference frame is acquired automatically.

Once obtained the desired configuration, it is possible to move to the next configuration step by pressing STATUS button.

v. Parameter setting

In the second configuration step it is possible to modify the functioning parameters of the selected inspection tool. The user can set the desired value by pressing UP/DOWN ARROWS to move the slider on the right side of the display. It is possible to scroll the parameters using LEFT/RIGHT ARROWS. The *Status* indicator on the right side, as well as the ROI contour reveals the result of control application by assuming red (bad result) or green (good result) colouring.

vi. Inspection monitoring and saving

Monitor mode allows the user to control how the configured inspection works. There are some different available monitoring options which can be recalled using ARROW buttons. SET button, instead, activates statistics panel.

Monitor mode	To activate press	Visualises
STANDARD	UP ARROW	- Acquired image
		- Tool used
		- Result
CAMERA	DOWN ARROW	- Acquired image
FAIL	LEFT ARROW	- Acquired image (the VSC displays only failure images)
		- Tool used
		-
ZOOM	RIGHT ARROW	- Acquired image (with 200% zoom)
		- Tool used
		- Result
STATISTICS	SET BUTTON	- Inspection result
		- Score
		- Average score
		- Score MIN-MAX
		- Execution time
		- Average execution time
		- Measurement count
		- Failure rate (%)

If the behaviour of the system is not satisfactory, it is possible to go back to the previous configuration steps by pressing ESC button. Once the inspection meets the user requirements, it can be stored on the currently selected memory slot by pressing TEACH button twice.
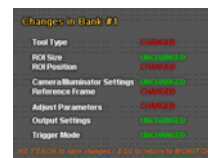
All the other functionalities and parameters of DataVS1 are available in the *MAIN* menu (from the *Monitor* mode press STATUS to access). Here the user can modify some configuration options.
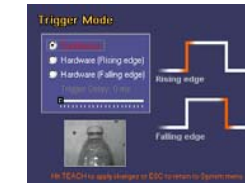
a. Output behaviour

Three digital outputs are available on the sensor. For each output a different behaviour can be set.
It is also possible to define the output duration and delay.

b. Trigger mode

DataVS1 can operate in continuous mode (image acquisition, elaboration, output activation, new image acquisition, and so on…) or with an external trigger (on the rising edge of the trigger signal as well as on the falling edge).

c. Bankset manager

On DataVS1 there are 20 memory slots in which 8 different inspections can be stored. From the bankset manager the user can load, store or clear an inspection
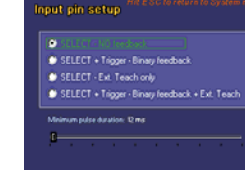
d. Fail inspector

The fail inspector allows the user to check the last 8 images of failure and also displays the reason why the control failed.

e. DataVS1 Version

From the panel *DataVS1 version* it is possible to check the firmware release installed on the sensor.

f. Input Config

Input Config menu allows for selecting the right digital Inspection switching protocol on SVS sensor.l
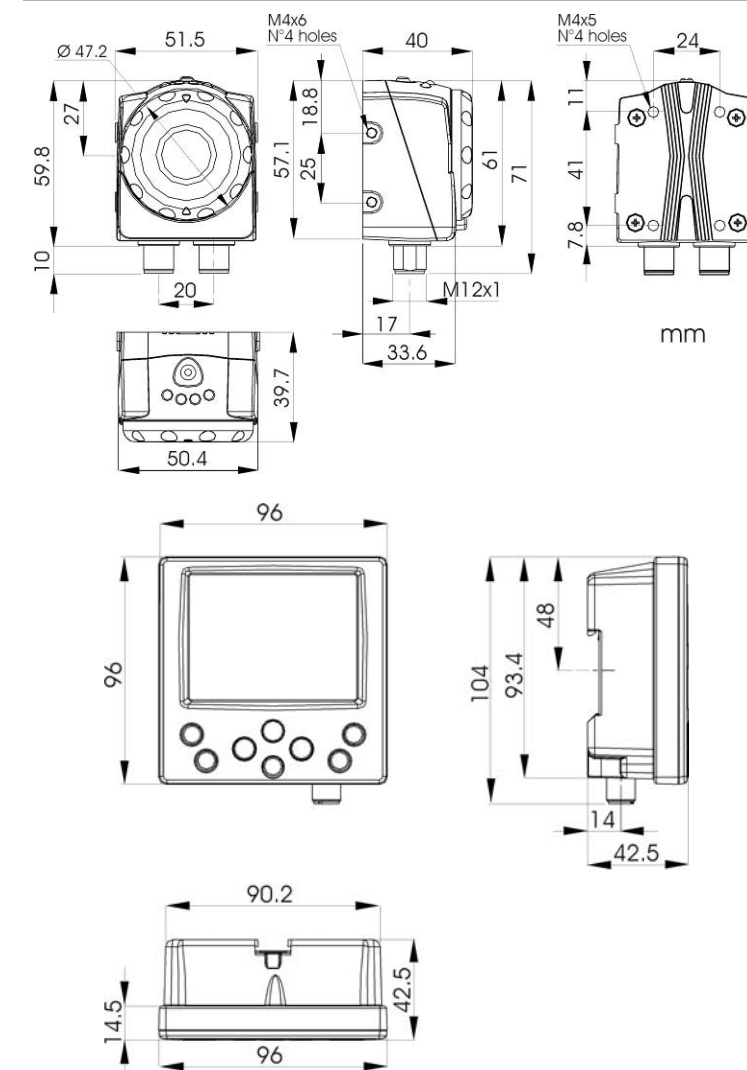
g. Password

It is possible to set a password in order to prevent the access to the configuration parameters to unauthorised personnel.

Control		Functioning	Applications
	Pattern Match	Searches for a pattern inside the target area	Verifies logo on food packages
	OCV	Character verification	Verifies the quality of printed characters
	Position	Identifies the object position edge (edge detection)	Controls the level of liquids in bottles
	Width	Measures the distance between two points	Assembling control
	Edge Count	Identifies all edges along an axis	Counts the blisters in stack for pharmaceutical
	Contrast	Calculates the contrast in an image	Verifies overprint of labels
	Brightness	Calculates the brightness of an image	Verifies the presence of cap and nozzle on phials
	Pattern Count	Searches and counts for a pattern inside the target area	Verifies logo on food packages

mm

CE