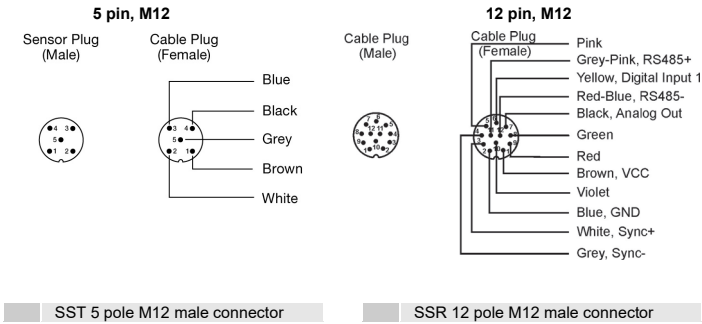


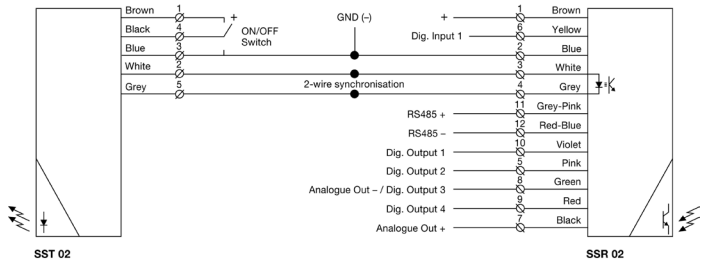
Product Data		
Electrical Data		
	SST (Transmitter)	SSR (Receiver)
Supply voltage	18 – 30 V dc	
Max. Voltage ripple	15 % (within supply range)	
Current consumption	100 mA (RMS)	75 mA
Max. outputs load	Digital	100 mA
	Analogue	Voltage: $Z_{load} \geq 1k\Omega$ Current: $Z_{load} \leq 600\Omega$
Reverse polarity protected	Yes	
Short circuit protected	Yes	
Inductive load protection	-	Yes
Environmental Data		
Light immunity @5° incidence	> 100.000 lux	
Temperature, operation	-30 to + 60 °C	
Sealing class	IP 67	
Marking	UK CA CE c RU US	

Available Models			
	Model	Beam spacing	Sensing Range
Transmitter	SST 02-xxx-xxx-05-H-1D1-0.5-J5	5 mm	10 m
	SST 02-xxx-xxx-10-H-1D1-0.5-J5	10 mm	
	SST 02-xxx-xxx-20-H-1D1-0.5-J5	20 mm	
	SST 02-xxx-xxx-40-H-1D1-0.5-J5	40 mm	
Receiver	SSR 02-xxx-xxx-05-H-UUK-ZZW-0.5-J12	5 mm	0.5 m – 10 m
	SSR 02-xxx-xxx-10-H-UUK-ZZW-0.5-J12	10 mm	
	SSR 02-xxx-xxx-20-H-UUK-ZZW-0.5-J12	20 mm	
	SSR 02-xxx-xxx-40-H-UUK-ZZW-0.5-J12	40 mm	

Connection	
Wiring Diagrams	



Transmitter Model	Black wire connected to (-)	Black wire not connected	Black wire connected to (+)
SST 02-xxx-xxx-xx-H-1D1-0.5-J5	not transmitting	transmitting	transmitting



UUK-ZZW	Pin 5 Pink	Pin 6 Yellow	Pin 7 Black	Pin 8 Green	Pin 9 Red	Pin 10 Violet
AC2 - DN2	Dig. NPN Out 2	Dig. Input 1	Analogue Out +	Analogue Out -	-	Dig. NPN Out 1
AC2 - DP2	Dig. PNP Out 2	Dig. Input 1	Analogue Out +	Analogue Out -	-	Dig. PNP Out 1
ANN - DN4	Dig. NPN Out 2	-	-	Dig. NPN Out 3	Dig. NPN Out 4	Dig. NPN Out 1
ANN - DP4	Dig. PNP Out 2	-	-	Dig. PNP Out 3	Dig. PNP Out 4	Dig. PNP Out 1

- = Not used

Type name: SSR 02-xxx-xxx-xx-H-UUK-ZZW-0.5-J8.
The letters **UUK-ZZW** determine the output configuration of the SSR 02.

Output configurations

Installation & Adjustments	
Installation	
The light curtain is configured by the PC program 'Telco Space Scan Terminal', described in the following pages. Before using it, check the power supply complies with electrical data.	
1	Mount the transmitter (SST) and receiver (SSR) facing each other and correctly aligned.
2	Wire the sensor according to the wiring diagram. Notice that the pin 2 on the SSR and the pin 3 on SST (blue wires) must be connected together to a common GND (-). Make sure the SSR output load does not exceed 100 mA.
3	Check for correct wiring before turning power on.
4	When the power on indicator (green LED) on SSR and SST is on, the system is operating.
5	The position of the receiver and transmitter must not be changed after power-up. The light curtain is only intended for static applications.

SSR Test Input	
The transmitter SST can be externally disabled and enabled via the black control wire for test purposes. When the transmitter is disabled the action of the receiver corresponds to breaking all beams.	
SSR Digital Input 1	
The digital input can be used to switch between two different output readings on the analogue output. The time from a transition on the digital input to a transition on the analogue output is dependent on the number of beams. The maximum transition time can be calculated as 500us + the number of beams multiplied by 15us. Using cross beam scan mode will double the number of beams. While communication on the RS485 is ongoing, the transition time will be considerably longer.	

Indicators		
SSR	Red LED	Status indicator
SSR	Yellow LED	Follows state of Digital Output 1
SSR & SST	Green LED	Power on indicator

Troubleshooting	
Probable Reason	Corrective Action
1. Symptom: Status indicator (Red LED) on SSR is constant on.	
SST has no power.	Check supply and supply cable to the SST
SST & SSR white, grey and blue wires are not connected correctly.	Connect the wires.

2. Symptom: Output indicator (Yellow LED) on SSR is flashing.	
Severe electrical interference.	Separate SSR and SST supply cable from high voltage cables.
Severe ambient light.	Swap position of SSR and SST.
Cross talk from another light curtain or photo sensor	Swap position of SSR and SST.
Cross talk from a nearby HF strip light	Swap position of SSR and SST or remove the strip light.

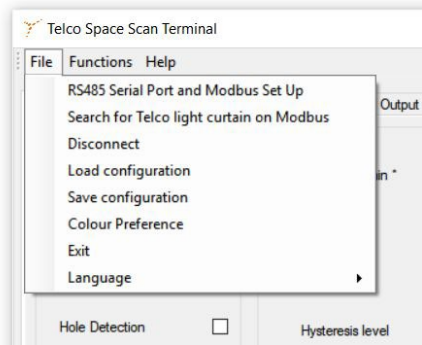
3. Symptom: Digital outputs do not response when IR beams are obstructed.	
One or more beams are blocked or the rails are out of sensing range.	Remove obstruction or reduce the distance between the rails.
The test input on SST is activated	Remove SST pin 4 (black wire) from ground.
Outputs are not configured for simple detection of obstructions	If needed factory reset the SSR using the System Information page in the PC program 'Telco Space Scan Terminal'



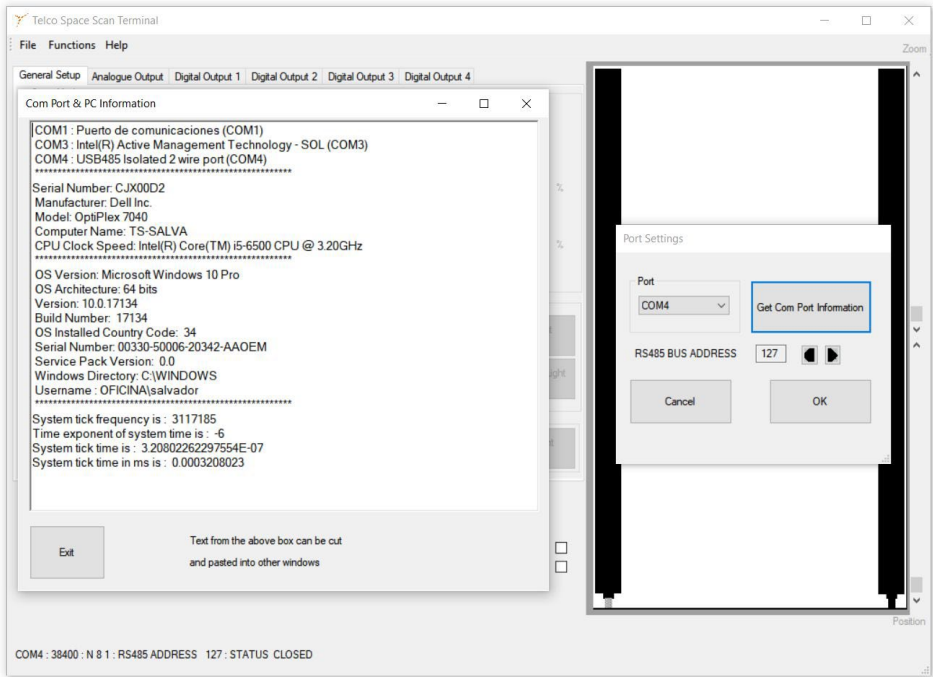
Warning
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SSR02 and PC connection

To setup or adjust a SS02 it is required to use the Telco Space Scan Terminal software together with an RS485 data link.



1. Start by selecting the **RS485 Serial Port and Modbus Set Up** and select the correct port to communicate with the SS02. If the port number is not known it is possible to press the **Get Com Port Information**. This will list all COM Ports used by the PC. (Full Com port details in Win7, WinXP only basic details are shown). The **RS485 BUS ADDRESS** is default 127, but address can be changed in the menu Function -> System Information.



2. Next press **Connect** and wait a few seconds before the connection is active.

File menu

RS485 Serial Port and Modbus Setup:

See SSR02 and PC connection.

Search for Telco light curtains on a Modbus.

Used for finding and identifying the Modbus address(es) of one or more light curtains on the Modbus. For more info see below.

Connect

See SSR02 and PC connection.

Load configuration

Used to load a file that will configure all functions of the light curtain in one go. The information is stored in a previously saved configuration file in ASCII format.

Save configuration

Saves information about the current configuration of the light curtain.

Colour Preference

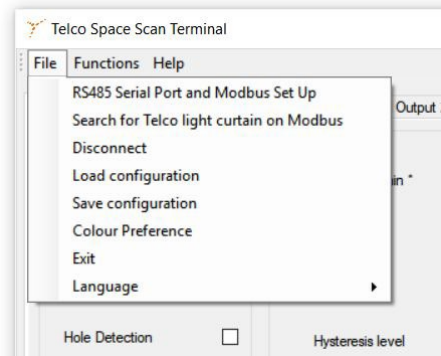
It is possible to set up to 7 different colours for the beams on the screen.

Exit

Exit and close the program.

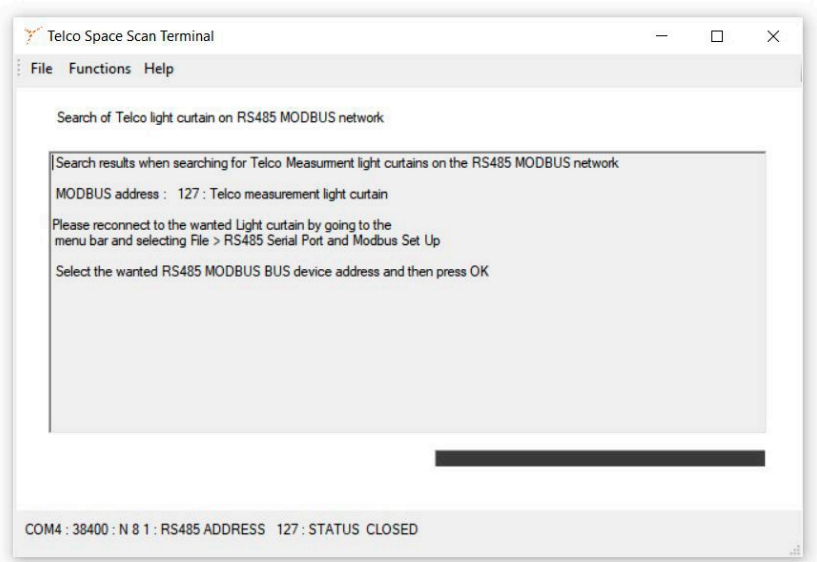
Language

Language selection.



File -> Search for Telco Light curtain on a Modbus

Use this function to find the **Modbus Address(es)** of Telco Light curtains on a Modbus, if the address(es) are unknown.



Functions menu

Overview:

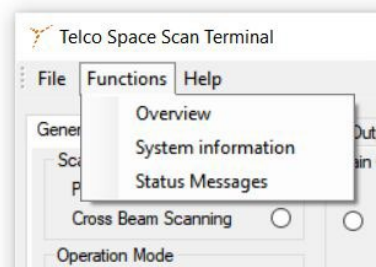
For configuration of outputs and measurement functions and for reading output states.

System Information:

For basic system information and configuration of Modbus address.

Status Messages:

Status messages are logged and displayed by choosing this menu item. Each functions associated with each of these menu items will be described in detail the following.



Functions -> Overview -> General Setup tab

General Setup:

Right side shows the light curtain and the beam pattern. Unbroken or made beams are indicated by green and broken beams by red. The light curtain is in the setup oriented with the cable entry in the bottom.



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Functions -> Overview -> Analogue output tab

The figure below shows the window that appears when the Analogue Output tab is selected under **Function->Overview**. On this tab it is possible to define the operation of the analogue output i.e. the measurement on the beam pattern that is going to be performed. The tab contains a number of marked areas; Analogue Output, Analogue Output Function and Set Analogue output.

Analogue Output: In this box it is possible to **Enable Output** and **Disable Output**. When the output is enabled it is possible to select between **Current** output (4-20mA)* and **Voltage** output (0-10V)* using the pull down box.

*Referred to 0 Vdc, pin 8 green wire (Analogue Out -)

Analogue Output Function: The function of the analogue output depends on the setting of the control input on the receiver. If the **Digital Input 1** is connected to + (high), the function selected in the pull down box next to **Control input high** is active. If the **Digital Input 1** is connected to - (i.e. low) or not connected (N.C.), the function selected in the pull down box next to **Control input low (NC)** will be active. The functions selectable in the two boxes are identical. Notice that the status of the **Digital Input 1** can be read in the **Input and Output Status** field. Following function can be selected.

Analogue Output Moving Average: The time constant defines how long the averaging is. The value can be from 0 to 2000 ms.

Measurement functions:

DIS: Disabled output. Output is disabled, i.e. constantly de-energised.

FBB: First Beam Blocked. Position of the first beam blocked.

FBM: First Beam Made. Position of the first beam made.

LBB: Last Beam Blocked. Position of the last beam blocked.

LBM: Last Beam Made. Position of the last beam made.

MBB: Middle Beam Blocked. Position of the (FBB+LBB)/2 rounded to nearest integer

TBB: Total Beams Blocked. Total number of beams blocked.

TBM: Total Beams Made. Total number of beams made.

CBB: Contiguous Beams Blocked. Reads out the number of beams in the largest group of adjacent beams blocked.

CBM: Contiguous Beams Made. Reads out the number of beams in the largest group of adjacent beams made.

TRN: Number of Transitions. The number of transitions in the beam pattern between made beams and blocked beams.

OD: Outside dimensions. Reads out LBB - FBB+1, corresponding to the size of a single object contained in the beam pattern, counted in beam breaks.

ID: Inside dimensions. Reads out the count of beams made between first beam broken and last beam broken. This corresponds to the size of a hole in a single solid object in the light curtain.

CFBB: Contiguous First Beam Blocked. Reads out the number of the first beam in the largest group of adjacent beams blocked.

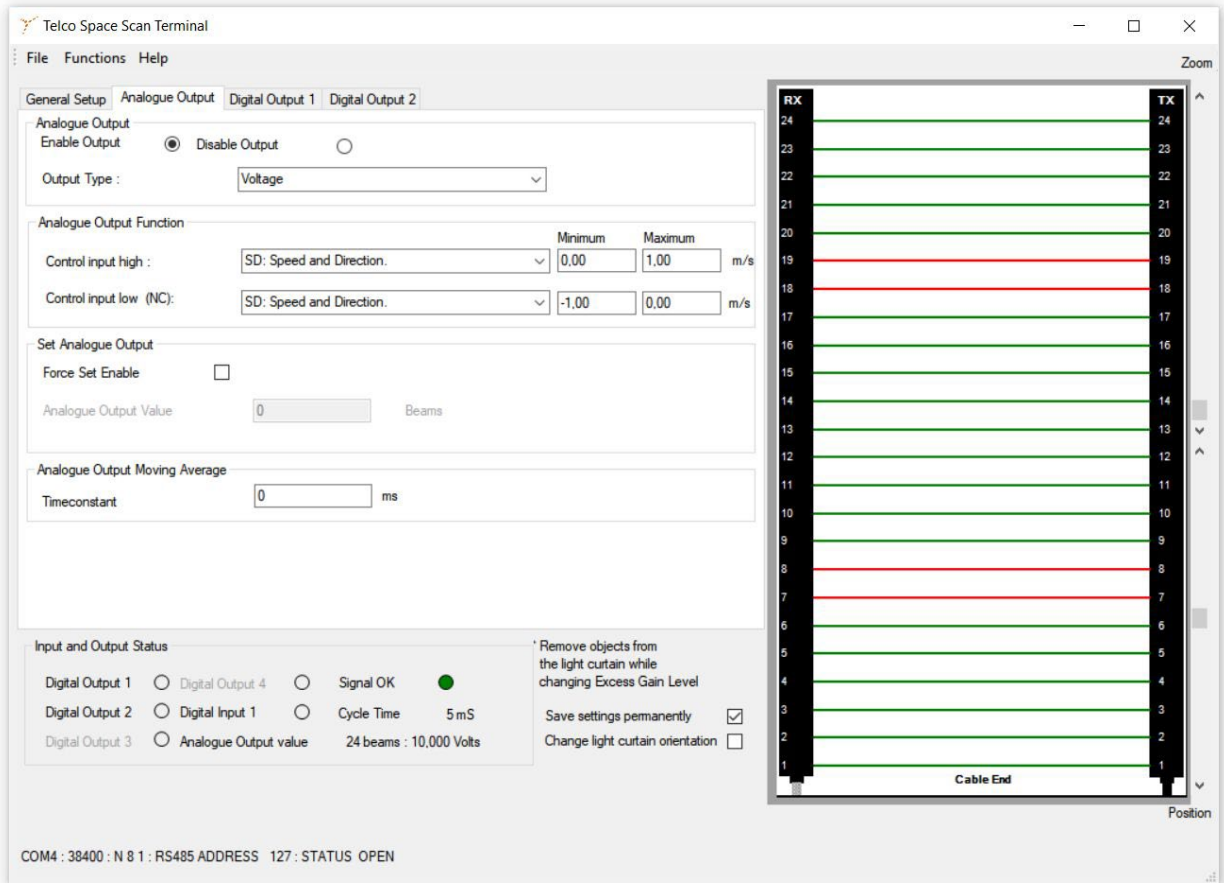
CLBB: Contiguous Last Beam Blocked. Reads out the number of the last beam in the largest group of adjacent beams blocked.

Force Set Enable: Marking the checkbox **Force Set Enable** disables all measurements and enables the user to set the output value in the textbox next to **Analogue Output Value**. This function can be used for test and calibration purposes.

SD: Speed and Direction. Reads out the velocity of an object. The input box 'minimum speed' is used to define the velocity that corresponds to 4 mA/ 0 V. The input box 'maximum speed' is used to define the velocity that corresponds to 20 mA / 10 V. Notice that both negative and positive values in the interval between -40 m/s and +40 m/s can be used. If objects are moving in direction of larger beam numbers the beam number the velocity is positive. If the objects are moving in the direction of smaller beam numbers the velocity is negative.

Note: The beams are counted starting with one from the end of the cable entry.

Note: Unintended use of pre-filtering, i.e. hole detection or Maximum Area of adjacent beams blocked set different from 0 can lead to unexpected results!
If crossed beam setting is used, the effective beam number is increase by a factor of 2.



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Functions -> Overview -> Digital Output tabs

The **Digital Output 1** tab, selected under **Function->Overview**, it is possible to define the operation of **Digital Output 1**.
If the light curtain is equipped with multiple digital outputs, the other outputs can be configured by using the other identical digital output tabs.
The digital output tab contains 3 marked areas: **Digital Output**, **Digital Output Function** and **Set Digital Output**.

Digital Output: To **Enable Output** and **Disable Output**.

Digital Output Function:

A digital output can read out only two values which are associated with the Boolean values true and false; the output is either high = true or low= false.
The output value is the result of the evaluation of a Boolean expression, that here is set up using the two pull down-boxes and text input box.

The first box contains the same list of functions as available under Analogue Output Function, plus the ABBA function.

The second box contains a list of comparison operators.

The third box is used to type in a number. If the expression is true, the out will be high, and if the expression is false, the output will be low.

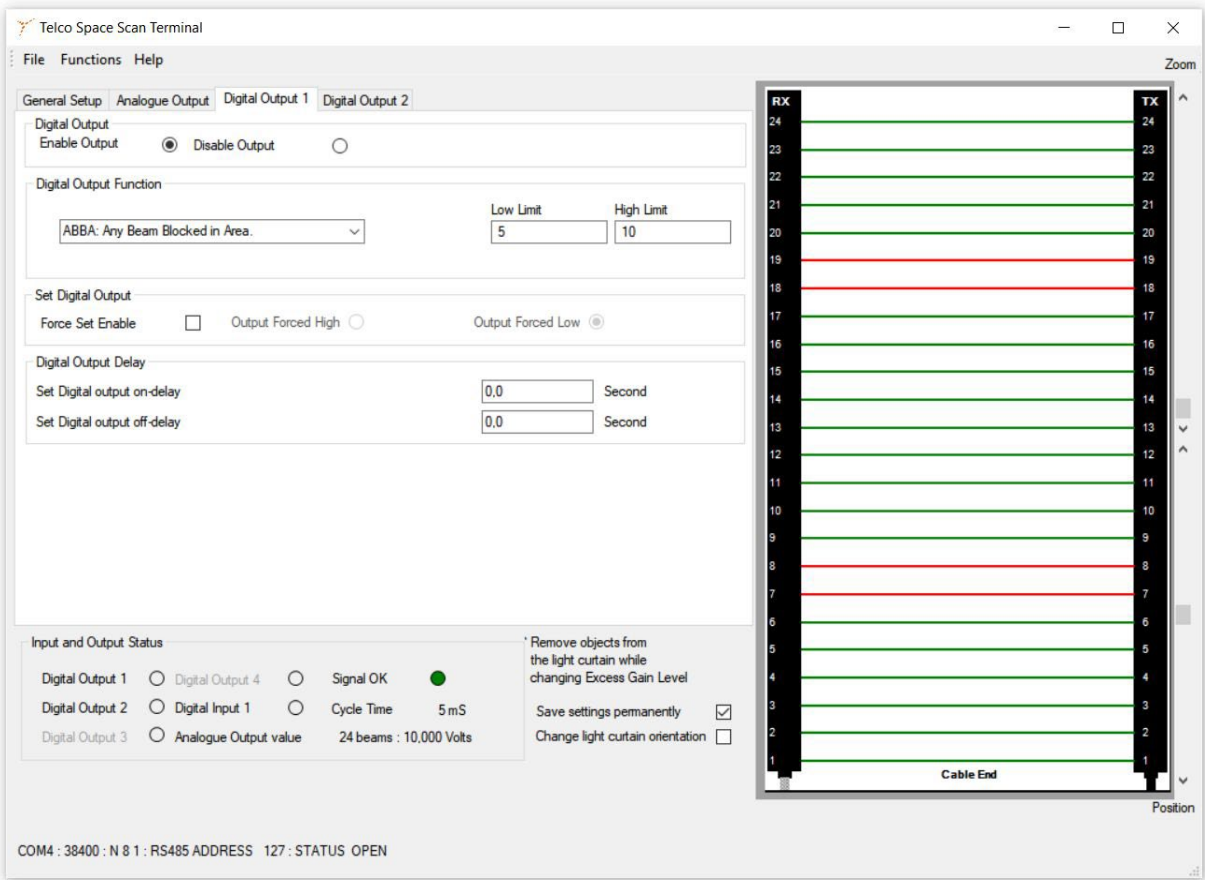
The selection "Any Beam Blocked in Area" has two values minimum and maximum. The output is high if one or more beams are broken with beam numbers that are larger than or equal to Minimum and smaller than or equal to Maximum.

With the selection "Signal Alarm" the output is set high if the signal is not OK.

Set Digital Output

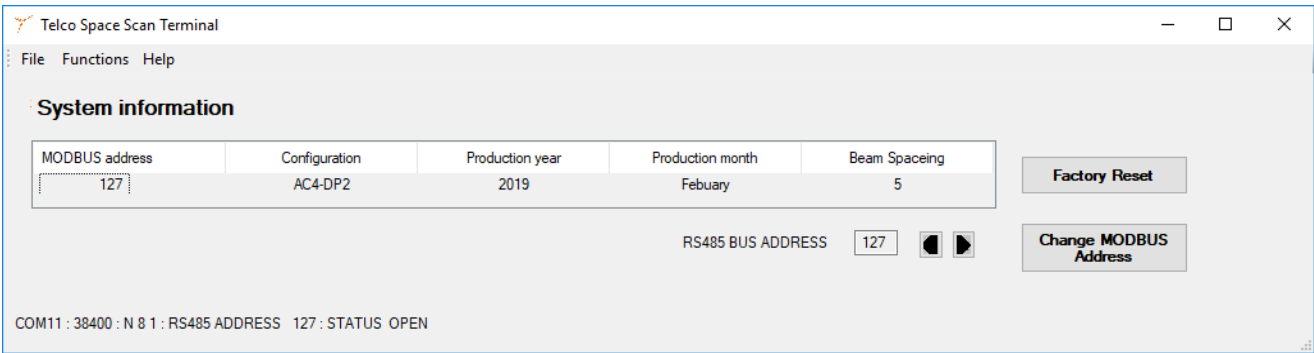
Marking the checkbox **Force Set Enable** disables the **Digital Output Function** and enables the user to set the digital output high by selecting **Output Forced High** or low by selecting **Output Forced Low**. The function is primarily intended for test purposes.

Output delay: On-delay specify the time between the expression becomes true and the output is switched accordingly. Off-delay specify the time between the expression becomes false and the output is switched. On-delay and off-delay is selectable between 0 and 10 s.



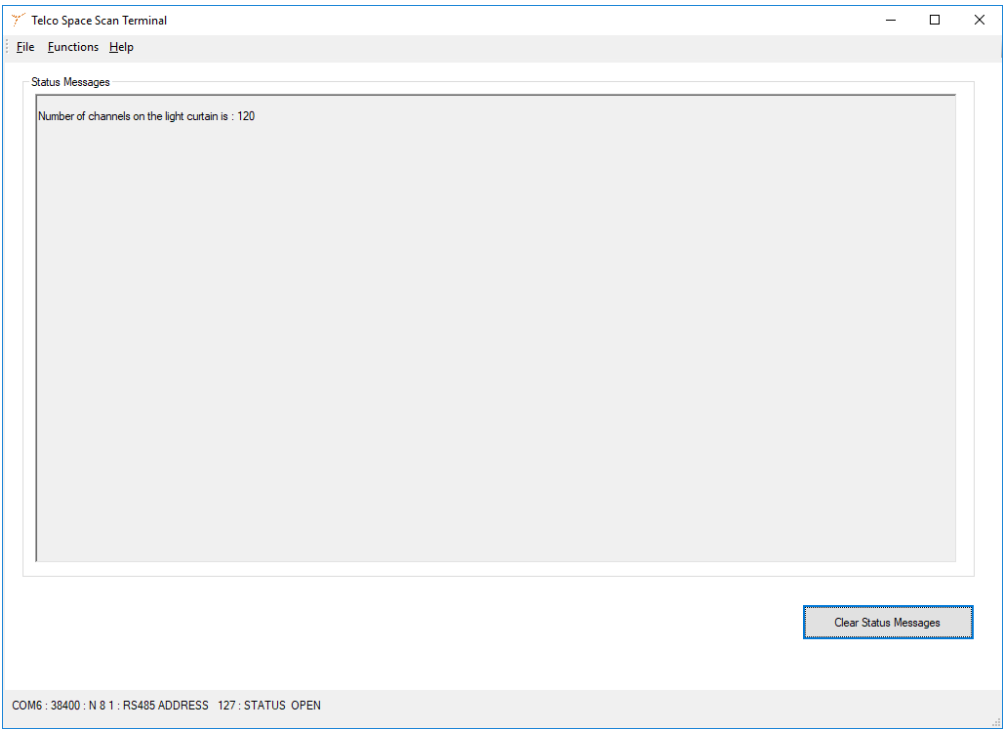
Functions -> System information

System information contains the information displayed in the figure below. The MODBUS address can be modified using the Change MODBUS Address button.



Functions -> Status Messages

Selecting **Functions -> Status messages** makes the window below appears. Status messages and error messages are logged and displayed. The log can be cleared by pressing the button **Clear Status Messages**.



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