SC5100

PRODUCT REFERENCE GUIDE



Controller

DATALOGIC

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Patents

See www.patents.datalogic.com for patent list.

This product is covered by one or more of the following patents:
Utility patents: EP3074915B1, IT1404187, JP5947819B2, US10229301, US9349047, ZL201280010789.8

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PREFACE

ABOUT THIS MANUAL

This Product Reference Guide (PRG) is provided for users seeking advanced technical information, including connection, programming, maintenance and specifications. The Quick Reference Guide (QRG) and other publications associated with this product can be downloaded free of charge from the website listed on the back cover of this manual.

Manual Conventions

The following conventions are used in this document:

The symbols listed below are used in this manual to notify the reader of key issues or procedures that must be observed when using the reader.



NOTE: This symbol draws attention to details or procedures that may be useful in improving, maintaining, or enhancing the performance of the hardware or software being discussed.



CAUTION: This symbol advises you of actions that could damage equipment or property.



WARNING: This symbol advises you of actions that could result in harm or injury to the person performing the task.



HIGH VOLTAGE: This symbol alerts the user they are about to perform an action involving, either a dangerous level of voltage, or to warn against an action that could result in damage to devices or electrical shock.



GROUNDING: This symbol advises you to pay particular attention to the grounding instructions for correct device functioning.



ESD: This symbol identifies a procedure that requires you take measures to prevent Electrostatic Discharge (ESD) e.g., use an ESD wrist strap. Circuit boards are most at risk. Please follow ESD procedures.

TECHNICAL SUPPORT

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For quick access, from the home page click on the search icon , and type in the name of the product you're looking for. This allows you access to download Data Sheets, Manuals, Software & Utilities, and Drawings.

Hover over the Support & Service menu for access to Services and Technical Support.

Reference Documentation

The documentation related to the SC5100 controller is listed below:

- CBX 510, 100 and 800 Product Reference Guides
- Guide to Installing a Redundant System
- PWR-480B Installation Manual
- SC5100 On Line Help
- WebSentinel PLUS and WebSentinel PLUS Investigator Guides

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User's assets are located. In the event an action is brought to enforce the terms and conditions of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees, both at trial and on appeal.

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The number of arbitrators will be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties will appoint a third arbitrator who will act as chairman of the proceedings. Vacancies in the post of chairman will be filled by the president of the SIAC. Other vacancies will be filled by the respective nominating party. Proceedings will continue from the stage they were at when the vacancy occurred. If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator will be the sole arbitrator, provided that the arbitrator was validly and properly appointed. All proceedings will be conducted, including all documents presented in such proceedings, in the English language. The English language version of these terms and conditions prevails over any other language version.

12.4. Attorneys' Fees. In the event an action is brought to enforce the terms and conditions of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees, both at trial and on appeal.

– END –

COMPLIANCE

Power Supply

This product is intended to be installed by Qualified Personnel only.

CE Compliance

CE marking states the compliance of the product with essential requirements listed in the applicable European directive. Since the directives and applicable standards are subject to continuous updates, and since Datalogic promptly adopts these updates, therefore the EU declaration of conformity is a living document. The EU declaration of conformity is available for competent authorities and customers through Datalogic commercial reference contacts. Since April 20th, 2016 the main European directives applicable to Datalogic products require inclusion of an adequate analysis and assessment of the risk(s). This evaluation was carried out in relation to the applicable points of the standards listed in the Declaration of Conformity. Datalogic products are mainly designed for integration purposes into more complex systems. For this reason it is under the responsibility of the system integrator to do a new risk assessment regarding the final installation.



WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EAC Compliance

Customs Union:

The CU Conformity certification has been achieved; this allows the Product to bear the Eurasian mark of conformity.

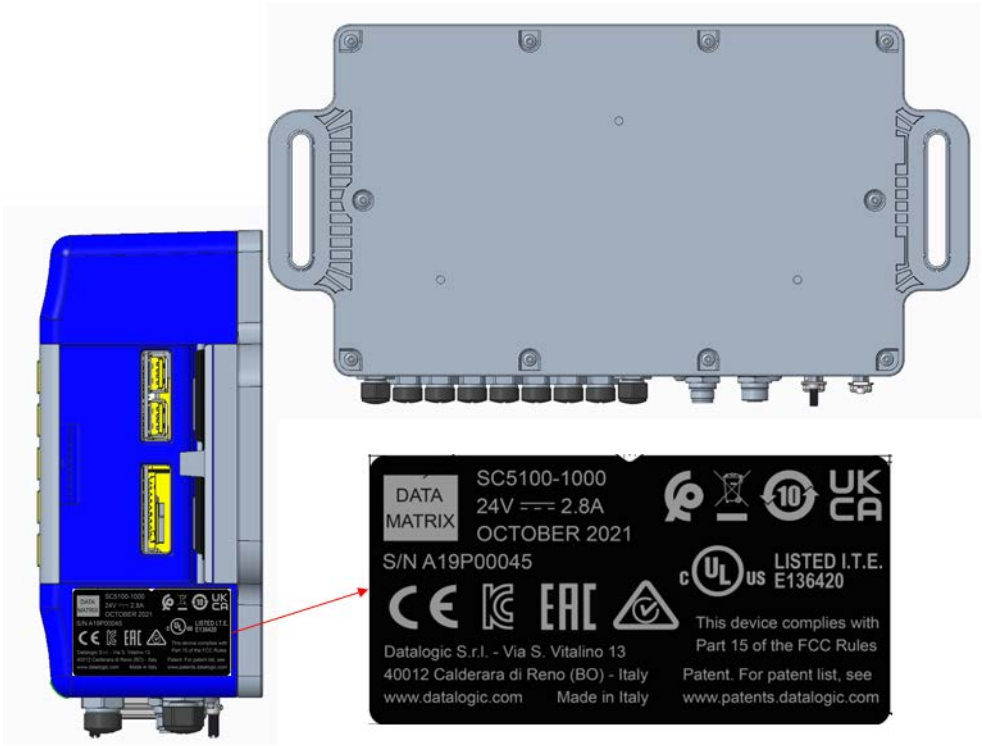
FCC Compliance

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use the equipment.

This device complies with PART 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

SERIAL LABELS



HANDLING

The SC5100 Controller is designed to be used in an industrial environment and is built to withstand vibration and shock when correctly installed. However, it is also a precision product and must be handled correctly before and during installation to avoid damage.

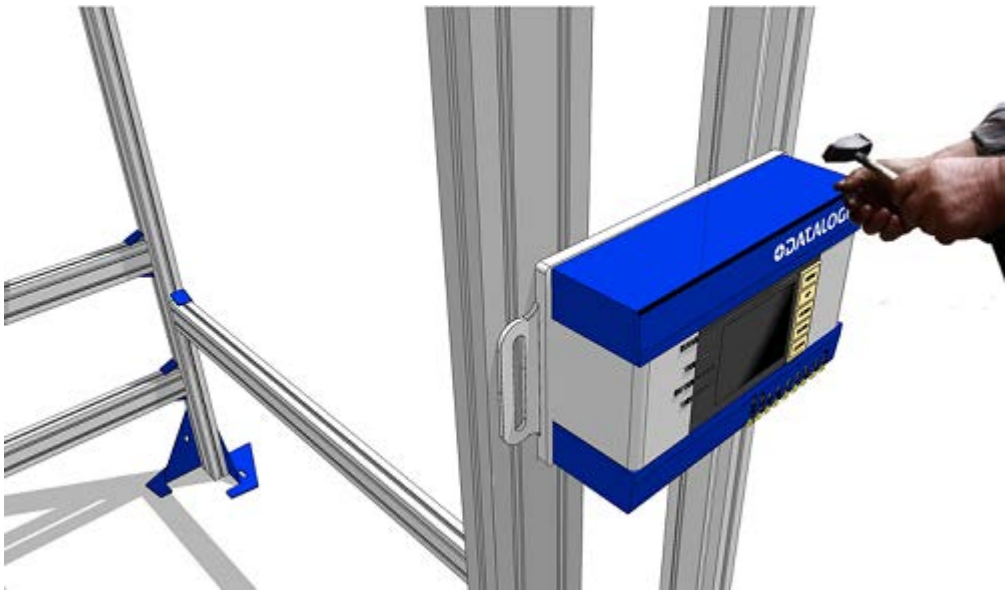
Do not drop the controller.

NO!



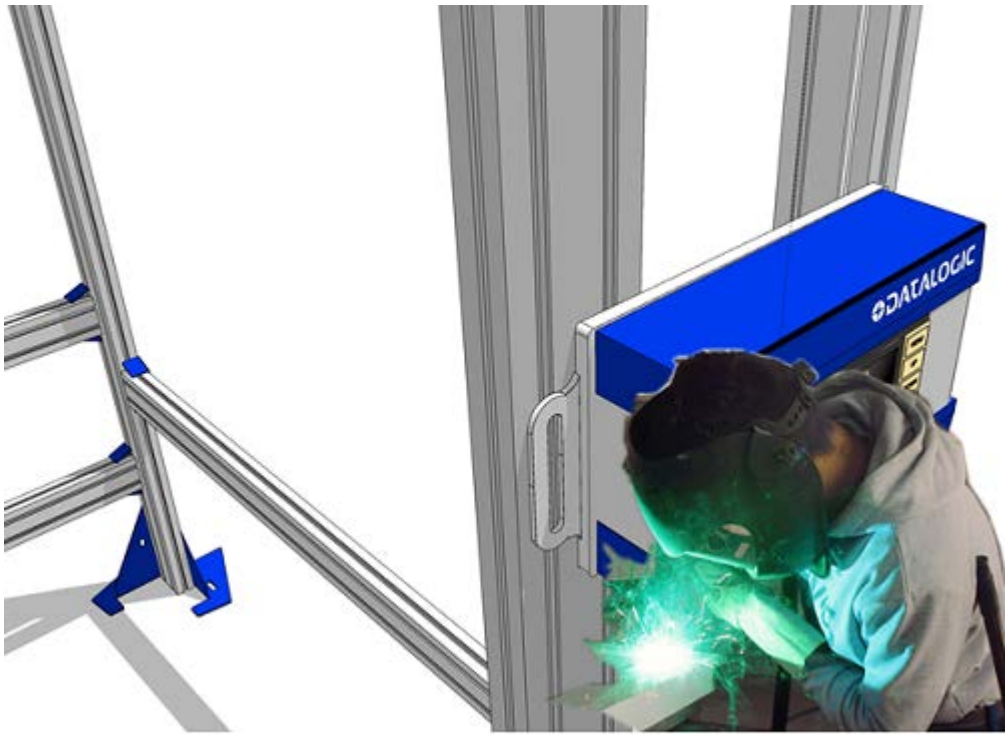
Do not fine tune positioning of the controller by striking it or its mounting bracket.

NO!



Do not weld the controller into position, which can cause electrostatic, heat or reading window damage.

NO!



Do not spray paint near the controller which can cause damage to the display window.



CHAPTER 1
INTRODUCTION

ABOUT THE CONTROLLER

The SC5100 is the next generation System Controller. It includes native Integration throughout the Datalogic Stationary Industrial Scanner Portfolio (DS/DX Laser readers, AV Imagers, DM Dimensioner, Matrix 320, WebSentinel PLUS (and Investigator) and Openness to 3rd Party components (i.e. RFID, scale, IP camera). The result is full support of advanced System Solutions (DWS=Scan-Dim-Weight, BHS=Baggage Handling System, MFDS=Mass Flow Detection System etc.) and open architecture for new application solutions.

A fully configurable embedded four port Gigabit Ethernet Switch, optional fieldbus modules and extended memory to implement External Alibi Storage for Scales provide State-of-the-Art tools for local and remote monitoring (ready to operate in IoT and Industry 4.0 environments).

The SC5100 provides a five inch color display, augmented visibility of LED indicators and keypad to guarantee exceptional user experience and monitoring efficacy.

All networking connectors are M12 industrial grade making it possible to install the device directly beside conveyor/sorting machinery without an additional enclosure.

The controller provides tools to seamlessly reach each component, monitor performance and system health in real-time. It can be doubled (two controllers for each System) thus providing fully redundant connection to a Customer's network to reduce downtime risk.



SC5100 Controller

The SC5100 Controller key functions include:

- Cluster management and Host interface of a multi-sided reading tunnel based on EBC (Matrix 320 connection via EBC Connector box) and Ethernet;
- Automatic procedure for scanner and bus controller replacement;
- Easy to use diagnostics on the reading station, based on LEDs and display
- Easy remote access to all of the reading station information, thanks to built-in Ethernet (all models) and fieldbus (Profibus or Profinet models) connectivity
- Single and Redundant System configurations;
- Integration with Dimensioners and Vision Systems; SC5100's efficiency in hybrid solutions
- Collects and consolidates data
- Provides systems diagnostics
- Energy Saving allows turning on/off the motors and lasers of all network scanners according to the selected digital input, encoder, or communication channel.
- 2 Configurable I/Os, Tach and Trigger, 2 EBCs, 1 Sync In, 1 Sync Out, 4 Ethernet, 2 USB ports.
- The simple and sturdy mechanical structure makes the SC5100 Controller the ideal solution for industrial environments.
- Fully compatible with DS8110 and DX8210 scanners.
- Trigger and Encoder/Tach PNP inputs are available via M12 circular connectors
- Connects to two CBX boxes
- SD Expansion slot
- Communicates with a variety of customer protocols

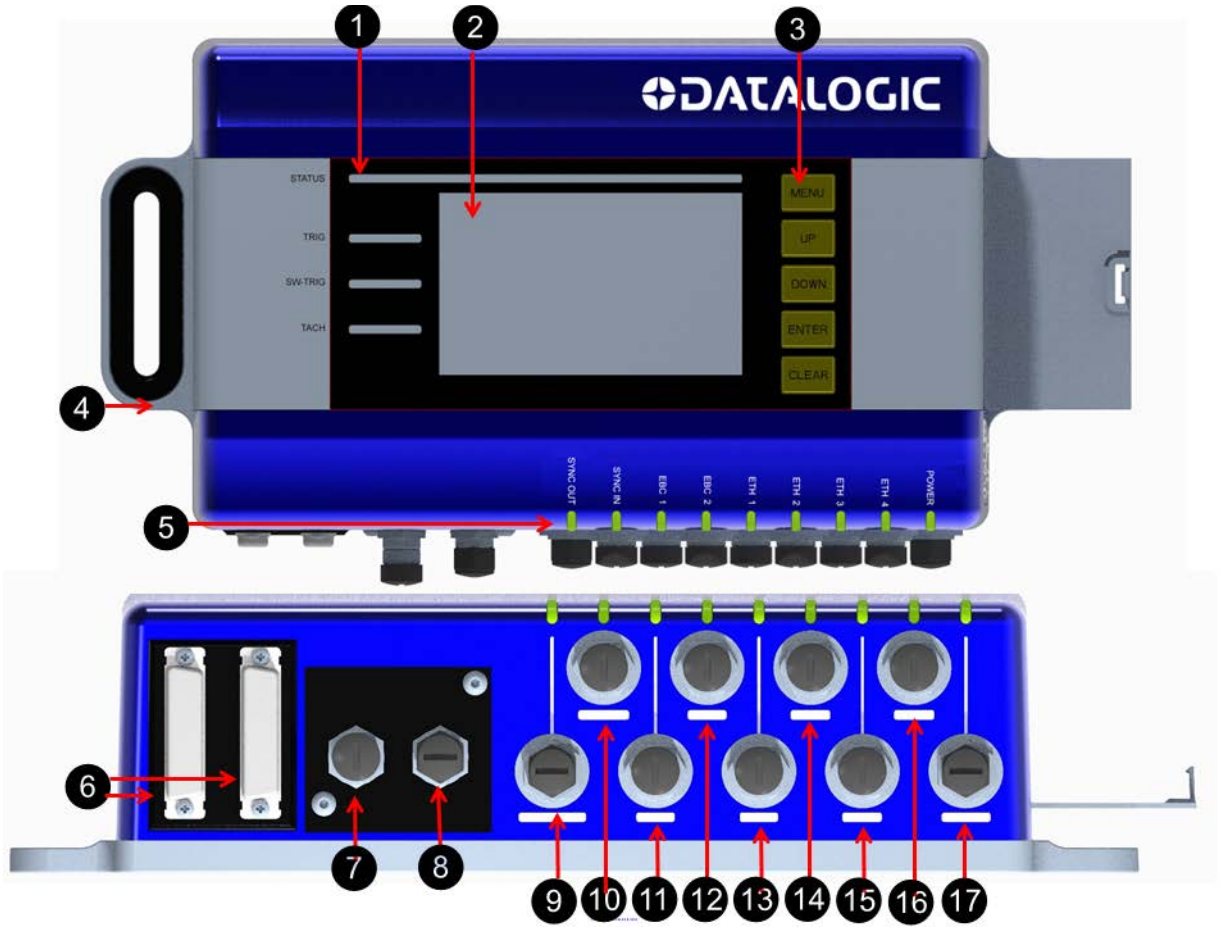


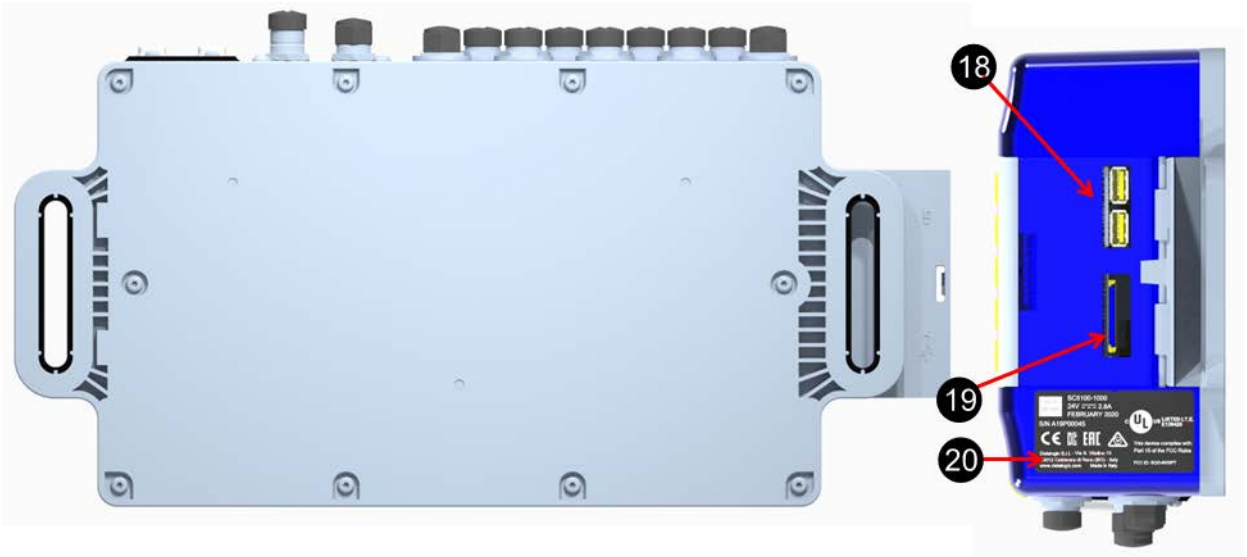
NOTE: The SC5100 distributes trigger and encoder to all devices connected to the EBC or Sync net interfaces. Connecting trigger and encoder to those devices using another CBX is not necessary.

It is especially suited for the following applications:

- Parcel Sorting
- Small Package / E-Commerce
- DWS
- Airport BHS
- Retailers / Distribution
- Irregulars / Extra large / Pallets
- Loading / Unloading
- MFDS

GENERAL VIEW





1. Status LED
2. 5 inch graphical color display
3. 5 key keypad
4. Mounting Handles
5. 9 LEDs
6. 2 CBX box connections
7. Profinet models port X1.P2
8. Profinet models port X1.P1
9. Sync Out
10. Sync In
11. EBC 1
12. EBC 2
13. ETH 1 Host
14. ETH 2 CFG
15. ETH 3
16. ETH 4
17. Power
18. Access to two USB ports
19. Caution and Serial label
20. SD Card access

You can connect to the following external devices:

Mettler Toledo/OCS or other scales

RFID Readers

Other 3rd party devices

Display and LED Indicators

NOTE: Activity on Input 1 causes both the TRIG and SW-TRIG LEDs to activate simultaneously. The SW-TRIG LED is driven by a Fieldbus Host when Start Input from Bus is enabled.



System Signal LEDs

	Name	Colors	State	Function
1	POWER	BLUE RED	BLUE RED OFF	SC5100 Properly Powered Polarity on Power Reversed No Power Connected
2	TRIG	GREEN	ON OFF	Photoelectric Sensor Active Photelectric Sensor Not Active
3	SW TRIG	GREEN	ON OFF	Software Trigger Acknowledge Active Software Trigger Acknowledge Not Active
4	TACH	GREEN	BLINKING OFF for extended period	Encoder Active Encoder Inactive

System Event LEDs

	Name	Colors	State	Function
5	STATUS	GREEN RED YELLOW	GREEN RED YELLOW	Controller Status OK Scanner Cluster Failure Warning

Ethernet Status LEDs

	Name	Colors	State	Function
6 & 7	SYNC OUT SYNC IN	GREEN AMBER	Blinking Green and Amber Blinking Amber Off	Ethernet Port Activity 100 MBps Speed Ether Port Activity 10 Mbps Speed No Ethernet Connection
8 & 9	EBC 1 & 2	GREEN	Blinking Green and Amber Blinking Amber Off	Ethernet Port Activity 100 Mbps Speed Ethernet Port Activity 10 Mbps Speed No Ethernet Connection
10-13	ETH 1 - 4	GREEN	Blinking Green Blinking Amber Blinking Green and Amber Off	Ethernet Port Activity 1 Gbps Speed Ethernet Port Activity 100 Mbps Speed Ether Port Activity 10 Mbps Speed No Ethernet Connection

KEYPAD AND DISPLAY

The SC5100 display shows different messages according to the following operating modes. Use the SC5100 keypad to scroll through the windows or navigate in the menu.

Symbols	Meaning
Menu	Menu
Up	Scroll Up
Down	Scroll Down
Enter	Enter
Clear	Clear

Menu Functions and Navigation

The five yellow display buttons are used to navigate between display options and to access additional details within each display option.



When starting the SC5100, press **MENU** to see the all of the display options; they are:

DASHBOARD
READ RATE
ERRORS
BARCODES
TX MSGS
RX MSGS
NETWORK
I/O
SOFTWARE
UTILITIES

Press **MENU** again to clear the menu options.

Press **UP** to scroll up through the menu options and **DOWN** to scroll down. The menu selection you are on will appear in blue.

Press **ENTER** to access that menu option's display.

DASHBOARD

Dashboard provides an overview of the system status, including the overall read-rate.

Read Rate – Displays the system read rate since the last reset.

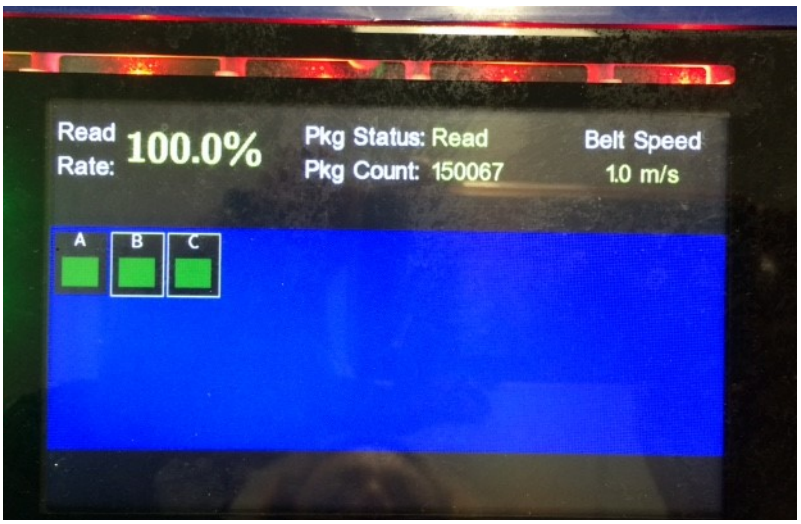
Pkg Status: This indicates whether the last package was a read/no-read/partial or multiple.

Belt Speed: Speed of conveyor in either feet per minutes or meters per second.

Device Status Indicators: These indicate the status of every device in the system. The LED can be “green” (okay), “red” (error) or “gray” (device not present).

The box around a device will turn green to indicate if that device read a barcode on the most recent package.

By pressing Up/Down, an indicator box allows the selection of a “device” in order to see the device name.



Below are Dashboards of a Redundant System showing the Primary Active and Backup Standby controllers.

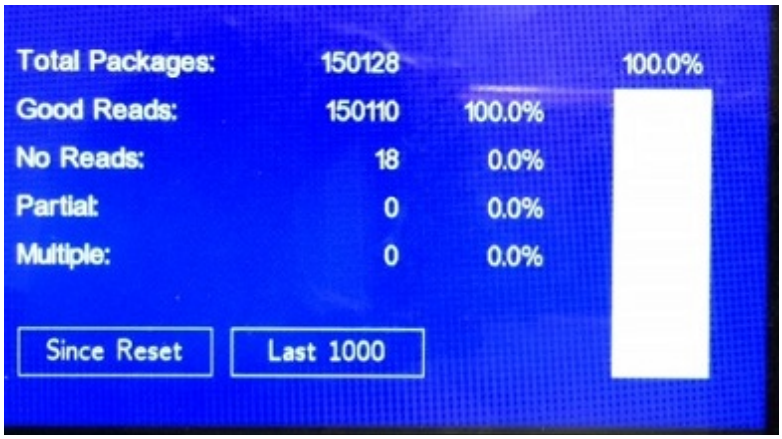


READ RATE

This display shows the overall read rate of the system. Both the read rate for the last 1000 packages and the read rate since the last 'reset' are available.

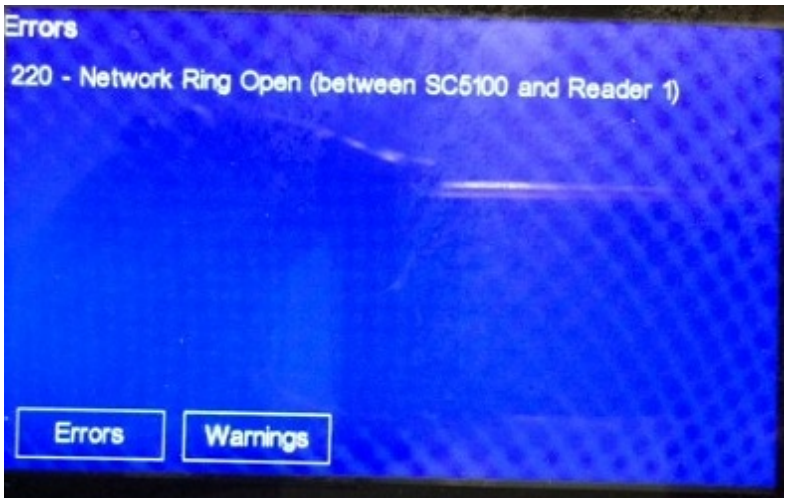
The Up/Down buttons are used to switch the display between the two sets of statistics.

The read rate is reset of a power cycle, parameter update or if rest from the e-Genius or the Utilities display.

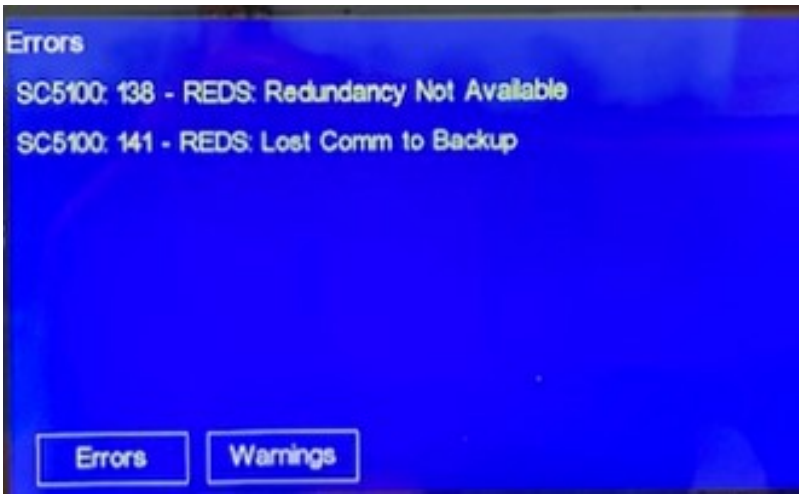


ERRORS

This displays is a list of all currently active errors and warnings. The Up/Down buttons are used to switch between errors and warnings.



Example errors from a Redundant system.



BARCODES

Displays a line for each barcode, with package sequence number and read position. If there are multiple codes per package, the sequence number is repeated.



TX MSGS

This option displays the complete transmitted message. Press **Up** or **Down** to scroll through the ports to monitor messages on each port.



RX MSGS

This option displays all messages received (protocol index), along with package assignment and indication of “placed location”. Press **Up** or **Down** to scroll through the various sources of data to monitor each.



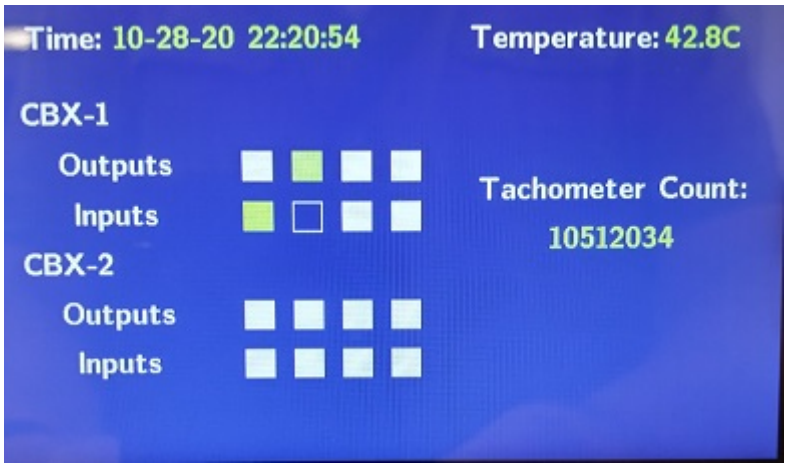
NETWORK

This options displays the IP address and network assignments for the Ethernet ports.



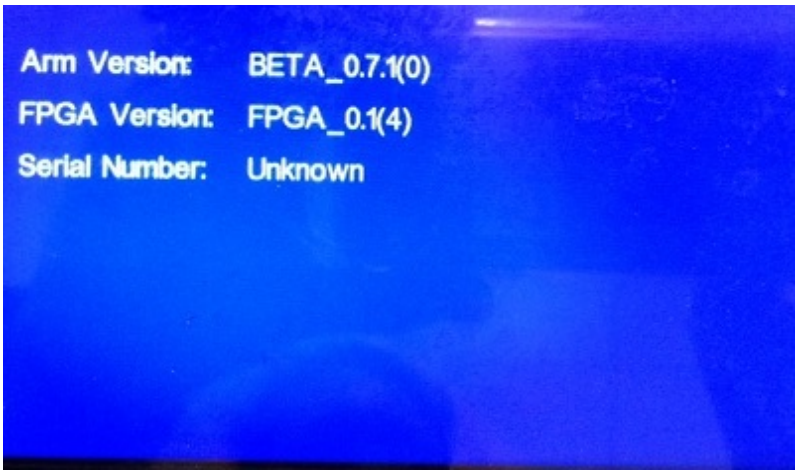
I/O

This option displays the input/outputs from the CBX units connected to the SC5100. Included with this information is the time, temperature, and tachometer count.



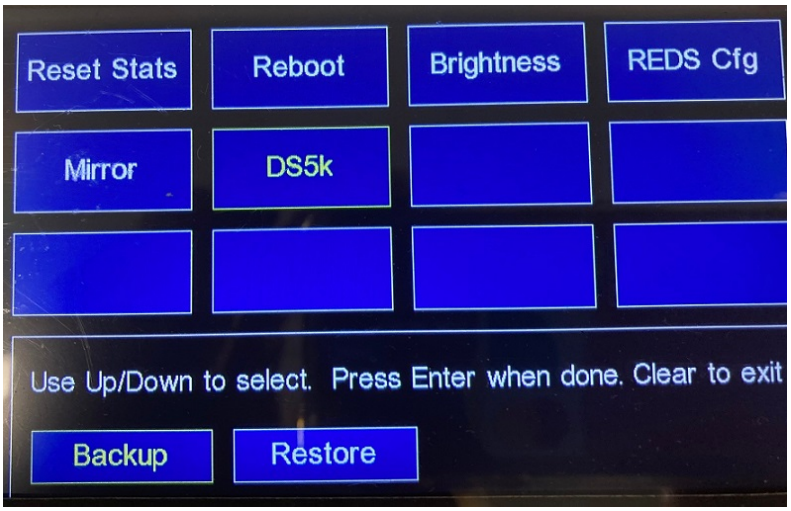
SOFTWARE

This option displays the software version, FPGA version and external alibi version (and checksum).



UTILITIES

This option allows you to perform simple tasks such as, adjusting the back light, resetting the read rate statistics, rebooting as well as providing various diagnostic tools.



Use Up/Down keys to select the utility.

Perform a Backup or Restore for the DS5000 using the SC5100 keypad. Go to Utilities, select DS5k and select Backup or Restore.

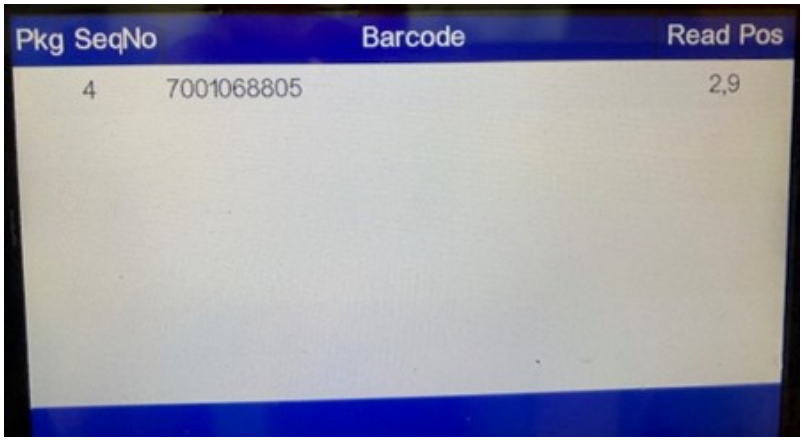
CHECKING THE SCANNERS ARE READING WITH SC5100 DISPLAY

You can verify that the Scanners are reading by using your Primary SC5100 display. Simply run a package through the system.

The **Dashboard** screen displays the Scanners 2 (B) and 9 (I) that have read the barcode.



This **Barcode** screen displays the package sequence number, barcode and the scanner positions of the scanners that read the code.



SC5100 Versions

The SC5100 Controller is available in the following versions:

Model	Description	Part Number
SC5100-100S	Standard Controller version	935750008
SC5100-100N	Profinet Controller version	935750010
SC5100-100B	Profibus Controller version	935750011
SC5100-102S	Alibi	935750012
SC5100-102N	Alibi Profinet	935750013
SC5100-102B	Alibi Profibus	935750014

Accessories

The following accessories are available on request for the SC5100 Controller.

Description	Material	Use
CAB-GE01 M12-IP67 TO RJ45 1M	93A050034	Gigabit Ethernet M12M-RJ45M
CAB-GE03 M12-IP67 TO RJ45 3M	93A050035	Gigabit Ethernet M12M-RJ45M
CAB-GE05 M12-IP67 TO RJ45 5M	93A050036	Gigabit Ethernet M12M-RJ45M
CAB-GE10 M12-IP67 TO RJ45 10M	93A051389	Gigabit Ethernet M12M-RJ45M
CORDSET,ENET,8P,(M) M12-(F) RJ45,0.2M	1000065716	Gigabit Ethernet M12M to RJ45 FEMALE adapter
CABLE M12M TO M12F 0,75M	93A050133	SyncNet 0.75 m
CAB-GE03 M12M TO M12F 3M	93A050079	SyncNet 3 m
CAB-SE05 M12M TO M12F 5M	93A050080	SyncNet 5 m
CAB-SE10 M12M TO M12F 10M	93A050081	SyncNet 10 m
ETH CABLE M12-M12 1M (STRAIGHT-STRAIGHT)	93A050065	EBC
ETH CABLE M12-M12 3M (STRAIGHT-STRAIGHT)	93A050066	EBC
ETH CABLE M12-M12 5M (STRAIGHT-STRAIGHT)	93A050067	EBC
ETH CABLE M12-M12 1M (STRAIGHT-90°)	93A050068	EBC to SC5100
ETH CABLE M12-M12 3M (STRAIGHT-90°)	93A050069	EBC to SC5100
ETH CABLE M12-M12 5M (STRAIGHT-90°)	93A050070	EBC to SC5100
ETH CABLE M12-M12 1MT LENGTH (90°- 90°)	93A050087	EBC between SC5100
ETH CABLE M12-M12 2MT LENGTH (90°- 90°)	93A050106	EBC between SC5100
ETH CABLE M12-M12 5MT LENGTH (90°- 90°)	93A050107	EBC between SC5100
CAB-ETH-M01 M12-IP67 ETHERNET CAB. (1M)	93A051346	Profinet Cable (M12M 4P - RJ45)
CAB-ETH-M03 M12-IP67 ETHERNET CAB. (3M)	93A051347	Profinet Cable (M12M 4P - RJ45)
CAB-ETH-M05 M12-IP67 ETHERNET CAB. (5M)	93A051348	Profinet Cable (M12M 4P - RJ45)

CAB-ETH-M10 M12-IP67 ETHERNET CABLE 10M	93A051391	Profinet Cable (M12M 4P - RJ45)
CAB-51TE M12F TRIG-ENC to SC5100 0.5M	93A050145	.5 M 5P Male Trigger and Encoder to SC5100 25P
CBL-1534-0.2 ADAPT. CABLE ETH M12-TO-RJ4	93A050057	100 Mb M12M to RJ45 FEMALE adapter
ETH CABLE M12-RJ45 5mt LENGTH (90°-RJ45)	93A050088	SC5100 to RJ45
CAB-NE03 M12M-8PINS TO M12M-4PINS 3M	93A050109	Gigabit to 100Mb adapter
CAB-NE05 M12M-8PINS TO M12M-4PINS 5M	93A050110	Gigabit to 100Mb adapter
PWR Cable (AS-I to M12 straight)-1mt	93ACC0067	ASi PWR tap 1 m
PWR Cable (AS-I to M12 straight)-2mt	93ACC0068	ASi PWR tap 2 m
PWR Cable, AS-I type, 2 Wires, 25 mt	93ACC0082	ASi PWR trunk
PWR CABLE, AS-I TYPE, 2 WIRES, 10 MT	93ACC0081	ASi PWR trunk
PG-100-K01 POWER SUPPLY 60W KIT (EU)	93ACC0059	PS 60 W
PG-100-K02 POWER SUPPLY 60W KIT (UK)	93ACC0060	PS 60 W
PG-100-K03 POWER SUPPLY 60W KIT (US)	93ACC0058	PS 60 W
PG-240-K01 POWER SUPPLY, 240W, M12 (EU)	93ACC0129	PS 240W 1 point
PG-240-K01 PWR SUPPLY,240W,4PT,M12 (EU)	93ACC0142	PS 240W 4 point
PG-240-K01 PWR SUPPLY,240W,8PT,M12 (EU)	93ACC0145	PS 240W 8 point
PG-240-K02 POWER SUPPLY, 240W, M12 (UK)	93ACC0130	PS 240W 1 point
PG-240-K02 PWR SUPPLY,240W,4PT,M12 (UK)	93ACC0143	PS 240W 4 point
PG-240-K02 PWR SUPPLY,240W,8PT,M12 (UK)	93ACC0146	PS 240W 8 point
PG-240-K03 POWER SUPPLY, 240W, M12 (US)	93ACC0128	PS 240W 1 point
PG-240-K03 PWR SUPPLY,240W,4PT,M12 (US)	93ACC0141	PS 240W 4 point
PG-240-K03 PWR SUPPLY,240W,8PT,M12 (US)	93ACC0144	PS 240W 8 point
PWR CABLE EXT. M12 MALE-M12 FEM 3MT	93ACC0149	5 pole M12 power extension 3 m
PWR CABLE EXT. M12 MALE-M12 FEM 5MT	93ACC0150	5 pole M12 power extension 5 m
CAB-LP-03 LIGHTING POWER 3M	93A050033	4 pole M12 to FL power (BRN+WHT and BLU+BLK,22AWG)
CAB-LP-05 LIGHTING POWER 5M	93A050037	4 pole M12 to FL power (BRN+WHT and BLU+BLK,22AWG)
CS-A1-03-G-03 5 POLI DIRITTO 3M GRIGIO	95ACC2110	5 pole M12 to FL (1BRN,2WHT,3BLU,4BLK,5GRY, 24AWG)
CS-A1-03-G-05 5 POLI DIRITTO 5M GRIGIO	95ACC2120	5 pole M12 to FL (1BRN,2WHT,3BLU,4BLK,5GRY, 24AWG)
CS-A1-03-G-10 5 POLI DIRITTO 10M GRIGIO	95ACC2140	5 pole M12 to FL (1BRN,2WHT,3BLU,4BLK,5GRY, 24AWG)

CS-A1-03-U-03 5 POLI DRITTO 3M UL 2464	95ASE1170	5 pole M12 to FL (1BRN,2WHT,3BLU,4BLK,5GRY, 24AWG) UL wire
CS-A1-03-U-05 5 POLI DRITTO 5M UL 2464	95ASE1180	5 pole M12 to FL (1BRN,2WHT,3BLU,4BLK,5GRY, 24AWG) UL wire
CS-A1-03-U-10 5 POLI DRITTO 10M UL 2464	95ASE1190	5 pole M12 to FL (1BRN,2WHT,3BLU,4BLK,5GRY, 24AWG) UL wire
CBL-1487 CONNECTOR M12/5P/FEMALE IDNET	93A050045	5 pole M12F screw terminal (18 AWG, 60V, 4A max.)
CBX510 CONNECTION BOX MODULAR	93A301087	CBX
CBX500 CONNECTION BOX MODULAR	93A301068	CBX
CBX100 CONNECTION BOX COMPACT	93A301067	CBX
Connection Cable SC5100 to CBX510	93A050071	SC5100/SC5100 CBX cable, 1 m
CAB-DS01-S M12-IP67 TO CBX 1M	93A050058	M12F 17P to 25P M CBX
CAB-DS03-S M12-IP67 TO CBX 3M	93A050059	M12F 17P to 25P M CBX
CAB-DS05-S M12-IP67 TO CBX 5M	93A050060	M12F 17P to 25P M CBX
CAB-DS10-S M12-IP67 TO CBX 10M	93A051390	M12F 17P to 25P M CBX
CAB-GD03 M12 F/L 3M	93A050076	M12 17P to flying lead
CAB-GD05 M12 F/L 5M	93A050077	M12 17P to flying lead
CAB-GD10 M12 F/L 10M	93A050078	M12 17P to flying lead
CAB-ETH-X-M01 M12-IP67 GETH-X CAB 1M	93A050122	Ethernet X-coded
CAB-ETH-X-M03 M12-IP67 GETH-X CAB 3M	93A050123	Ethernet X-coded
CAB-ETH-X-M05 M12-IP67 GETH-X CAB 5M	93A050124	Ethernet X-coded
CAB-F-ETH-M01 M12-IP67 GETH-X FLEX CAB1M	93A050125	Ethernet X-coded
CAB-F-ETH-M03 M12-IP67 GETH-X FLEX CAB3M	93A050126	Ethernet X-coded
CAB-F-ETH-M05 M12-IP67 GETH-X FLEX CAB5M	93A050127	Ethernet X-coded
CVL-2541 CBL M12A 5P MALE,3P TB,400MM	93ACC0221	Advantech UNO power adapter M12 to 3P TB
	770288000	Advantech UNO power adapter M12 to 2P TB
CBX510-DM3610 BOX FOR MULTIHEAD	93A301088	2-Headed Dimmer CBX
CAB-3605 SLAVE TO CBX 5M	93ACC0119	2-Headed Dimmer slave cable

GUIDE TO INSTALLATION

The following can be used as a checklist to verify all the steps necessary to complete installation of the SC5100 Controller.

1. Read all information in the section Compliance section of this manual "Compliance" on page xiii.
2. Correctly mount the SC5100. (**See Chapter 2**)
3. Connect complete system cabling according to the signals required for the application. This includes - EBC cluster cabling, encoder, package present sensor, host communications connections, power, etc. (**See Chapter 3**)
4. Power up the system.
5. Connect a PC to the SC5100 CFG port (Eth2) and access e-Genius. (**See On-line Help**)
6. If setting up EBC Devices, perform a "**Discover EBC Devices**" on the SC5100 interface.
7. If setting up SyncNet devices, perform a "**Discover SyncNet Devices**" on the SC5100 interface.
8. Rearrange the numbering of system devices as desired.
9. For EBC devices, perform Packtrack calibration and other setup required using the SC5100 interface or the application appropriate to the device.
10. For cameras on a SyncNet, perform initial configuration using the camera interface. Access via 'hyperlinks' in the SC5100 interface to 'pass-thru' to the cameras. OR, Connect to any camera in the SyncNet network via the Host port (Default IP 192.168.3.10). Using the camera interface, configure the following:
    - Camera cluster must be configured so cameras can share settings
    - **Operating Mode** should be set to match the SC5100 (normally Packtrack).
    - If Packtrack mode, the **Encoder Steps** should be the same.
    - Camera **Barcode Settings** should be configured to enable all barcodes the camera is to read. Configuration filters and groups are not necessary.
11. Setup **Image Saving** and **Mounting** in the camera interface.
12. Verify the frame rate and/or maximum lines per inch is set correctly. These values appear on the SC5100 SyncNet Devices page. For some older camera software they are settable on the SC5100; if they are grayed out they are set on the camera (as in a normal camera installation).
13. Setup all **Communications via Controller Settings** in the SC5100 interface.
14. Execute the **Backup** procedure for both the SC5100 and camera cluster.
15. Exit the configuration program for both the SC5100 and cameras and run your application.
16. The installation is now complete.

CHAPTER 2
MECHANICAL INSTALLATION

PREPARING FOR MECHANICAL INSTALLATION

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Review all installation-specific drawings provided with your equipment.
- Review and plan the mechanical installation of all devices used in your application. Be sure to allow adequate clearance for maintenance.
- Review and plan the power requirements for your application.
- Check the contents of the shipping cartons against the packing list.
- Record all product serial numbers.

UNPACKING INSTRUCTIONS

Verify that the SC5100 Controller and all the parts supplied with the controller are present and intact when opening the packaging; the list of parts includes:

- SC5100 Controller
- SC5100 Quick Reference Guide
- (2) Drop-In T-Slot studs and flange hardware (M8 thread or 5/16”-18), one per side

1. Open the SC5100 packaging.



2. Remove the foam layer to reveal the SC5100.

3.Remove the SC5100 from the package.



4. Check the (2) Drop in T-slot studs and flanges as well as the Quick Start Guide are in the package.

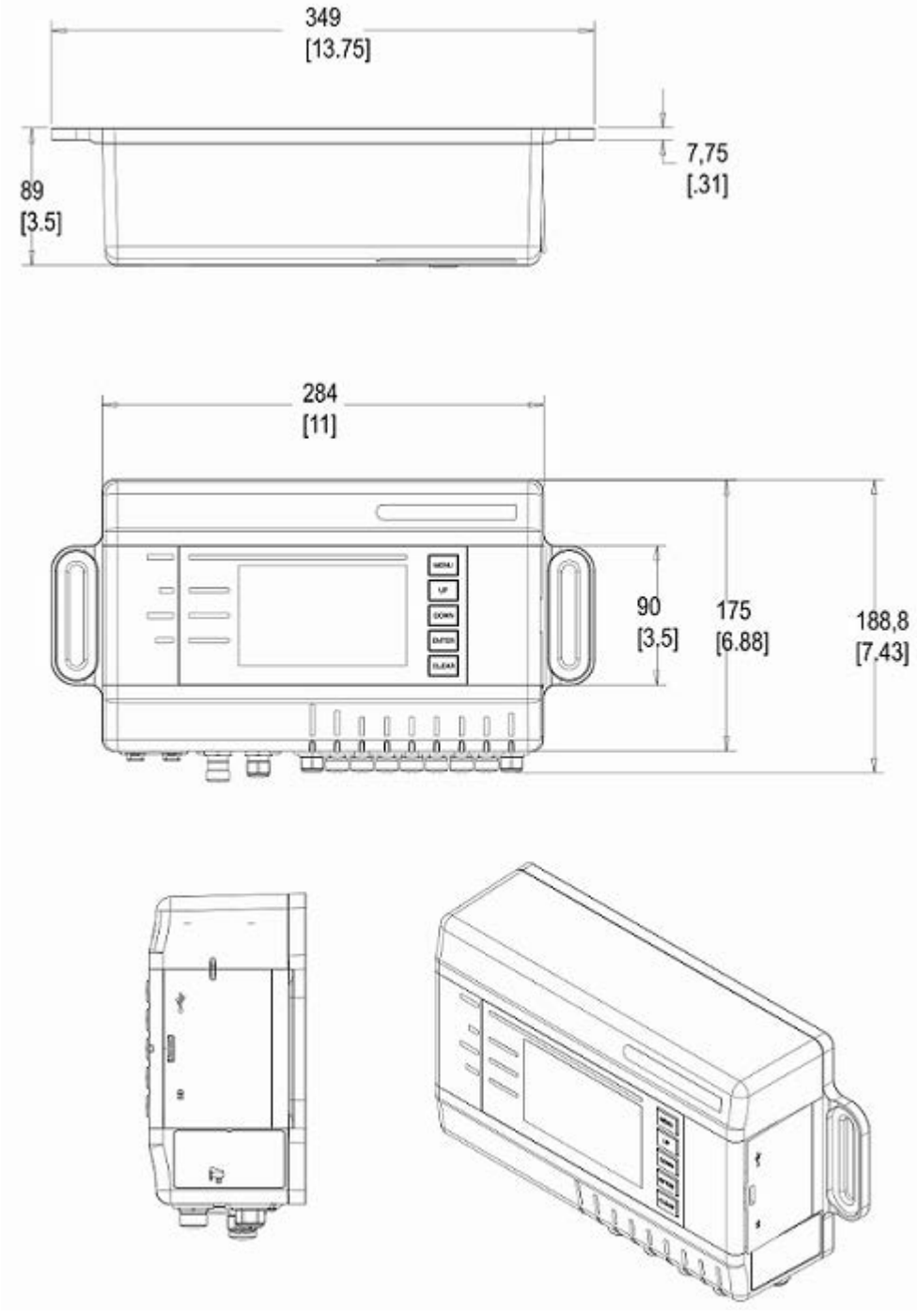
INSTALLATION SEQUENCE

To install the SC5100 follow the given procedure:

1. Select the mounting location and mount the SC5100 Controller.
2. Select the preferred power source to power the SC5100 via the M12 5P connector. See “SC5100 Electrical Connections” on page 25.

Dimensions and Clearances

Make sure to provide 300 mm (12 in) clearance around the SC5100. Measurements are in mm [inches].



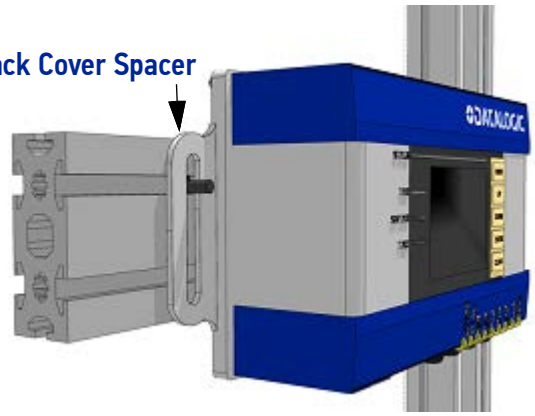
Mechanical Mounting

SC5100 can be mounted to a Bosch or 80/20® frame. Follow the steps outlined below:

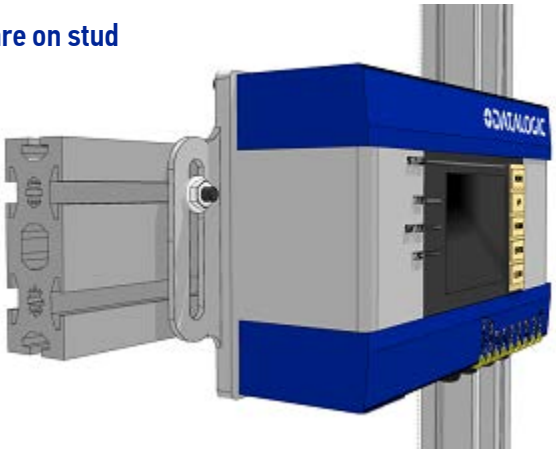


Drop T-Slot stud into slot of 80/20 or Bosch structure (M8 thread or 5/16”-18).

Place SC5100 Back Cover Spacer into place over T-stud.



Place Flange hardware on stud and tighten.



Make sure there is appropriate access to all other devices and power and provide 300 mm (12 in) clearance.

CHAPTER 3
ELECTRICAL INSTALLATION

PREPARING FOR ELECTRICAL INSTALLATION



WARNING: Electrical Installation must be performed by a qualified service Technician only! Procedures may involve exposure to high voltage. A trained and authorized technician must perform these procedures. Do not attempt to perform any electrical installation procedures unless you are a trained technician.

IMPORTANT: The SC5100 contain electronics that may be affected by electrostatic discharge (ESD). To prevent personal injury or damage to the unit, please follow the safety precautions and warnings found in the References section at the beginning of this manual. Failure to follow these precautions may void your warranty.

Before mounting any components, please do the following:

- Read all instructions before beginning your installation.
- Observe all electrical safety requirements discussed in the Introduction to this manual.
- Define and confirm the accuracy of your application's requirements.
- Review all installation-specific drawings.
- Review and plan the power requirements for your application.
- Review and plan the communications requirements for your application



IMPORTANT: The content of this manual may be superseded by any customer-specific documentation provided by Datalogic. Before proceeding with any installation procedures, be sure to review ALL documentation, especially content that contains details specific to your installation.

Everything should be MECHANICALLY INSTALLED before performing any ELECTRICAL INSTALLATION. See mechanical installation details.

To reduce the possibility of damage to the unit, check all cabling between the SC5100 Controller and other devices for accuracy.

CONNECTING AN SC5100 CONTROLLER

To install an SC5100, follow this sequence:

1. Complete mechanical installation.
2. Complete electrical installation **(See wiring illustrations provided in this chapter.)**
3. Observe all electrical safety requirements outlined in this chapter.
4. Ground the mounting structure to protective earth (PE) ground. See **"Grounding" on page 57**.
5. If used, wire the photoelectric sensor (or other trigger) to the CBX connection box.
6. Wire the tachometer to the CBX connection box if needed.
7. Wire serial ports to the CBX connection box if needed.
8. Connect the M12 end of the Ethernet cable to one of the controller's Gigabit Ethernet ports.
9. Connect all cameras or scanners to the **SC5100**.
10. Connect the SC5100 to its power supply.
11. Connect the power supply to the power source.
12. Setup / check controller operations

General Electrical Installation Precautions

It is important to follow these general precautions when installaing, setting up, operating, maintaining, troubleshooting or replacing any Datalogic products, parts or related equipment. As you plan and install your controller be sure to keep the following guidelines in mind.

- Determine the controller's proper location.
- Leave adequate clearances (approximately 300mm (12 in) for wiring.
- Route wires carefully to reduce or minimize electrical noise.
- When extraneous power and communication wiring must cross, make their intersection perpendicular. Avoid running power and data wiring parallel to each other. If possible, maintain one of the following separations between the power and data wiring:
  - 300 mm (12 in) gap
  - Use steel conduit and 25 mm (1 in) gap
  - 6.5 mm (0.25 in) of aluminum



NOTE: When planning your installation wiring, remember all power connections must be quick-disconnect. For PERMANENTLY CONNECTED EQUIPMENT a readily accessible disconnect device must be incorporated in the building installation wiring. For PLUGGABLE EQUIPMENT the socket-outlet must be installed near the equipment and must be easily accessible.

To assure no ESD damage will occur, be sure to observe the precautions outlined in the introduction to this manual.

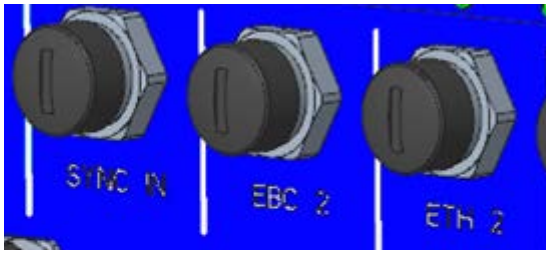


ESD CAUTION: Ground the mounting structure to safety ground (protective earth ground (PE). See"Grounding" on page 57 for wiring recommendations for safety ground.



WARNING: If a connector is not in use, it should always be covered with its protective cap.

Protective caps



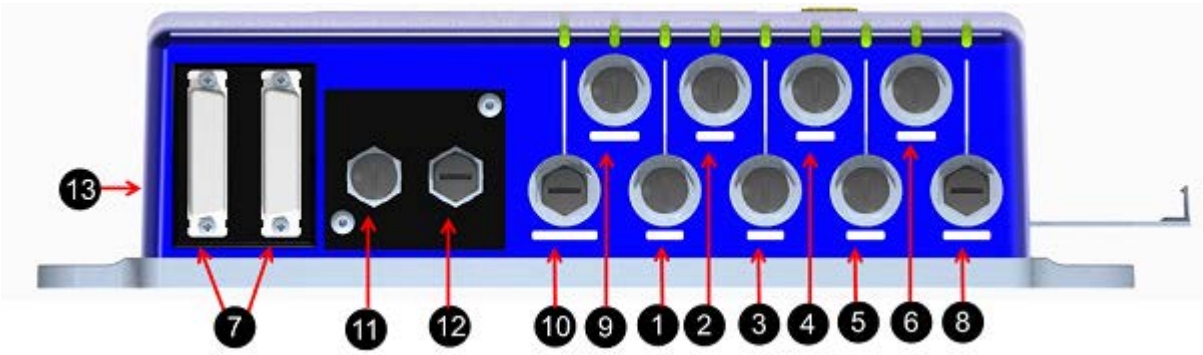
Route wiring from the controller through the wiring channels (if available) on the Datalogic mounting structure when interconnecting cables to other devices.



SC5100 Electrical Connections

After completing mechanical installation, use this section to properly connect your SC5100 controller model to the necessary devices:

1. **EBC1 -** Possible Laser Scanner (M12 4 pole female D Coded)
2. **EBC2 -** Possible Laser Scanner (M12 4 pole female D Coded)
3. **ETH1 - Host** Gigabit Ethernet-Default Host (M12 8 pole female A Coded)
4. **ETH2 - Ethernet** Gigabit Ethernet-Default Aux (M12 8 pole female A Coded)
5. **ETH3 - Ethernet** Gigabit Ethernet-Default Aux (M12 8 pole female A Coded)
6. **ETH4 - CFG** Gigabit Ethernet-Default Config (M12 8 pole female A Coded)
7. **I/O 1 & 2 -** to CBX's (25 Pin DSUB female)
8. **POWER** (M12 5 pole male A Coded)
9. **SYNC IN -** SC5100 or AV500/AV900 Camera in (M12 8 pole female A coded)
10. **SYNC OUT -** SC5100 or AV500/AV900 Camera out (M12 8 pole male A coded)
11. **PROFIBUS or PROFINET if available**. Profinet models port X1.P2
12. **PROFIBUS or PROFINET if available.** Profinet models port X1.P1
13. **USB -** General USB A 2.0 connections



Connecting a PC to the SC5100

During initial setup a PC or laptop may be connected to the SC5100. Connect an Ethernet cable to Ethernet 4, the default Configuration port of the SC5100, to your PC Ethernet port. For more information on using and connecting to e-Genius, see on-line help. The default IP Address for the Configuration Port is 192.168.3.100.

Power Connector Pin-Out Table

WARNING: When planning your installation wiring, remember all power connections must be quick-disconnect.

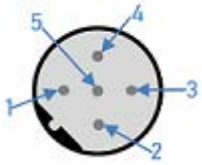
HIGH VOLTAGE: While performing the following wiring connection procedure, be sure to follow all safety regarding high voltage as outlined in the introduction to this manual. No power should be applied to any device until all wiring is completed and checked for accuracy.

WARNING: The socket-outlet must be installed near the controller. It must be a readily available disconnect device.

A CBX connection box provides flexible connectivity to a range of I/O devices and serial hosting. The SC5100 connects to two CBX boxes via I/O ports using 25-pin DSUB male to 25-pin female cables.

The recommended power supply and cabling is available with the SC5100 Controller. However, if your installation requires custom power supply wiring, the pin-outs of the unit power connector are provided below for your convenience.

Power Connector Pinout

M12 5P MALE	PIN	FUNCTION
	1	+24VDC
	2	+24VDC
	3	DC Return
	4	DC Return
	5	Earth Ground

NOTE: If a CBX510 connection box is connected to the SC5100 controller, it obtains power directly from the SC5100 controller through the 25-pin to 25-pin cable.

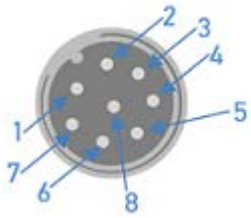
In cases where the AS-I cabling is not used, the alternative CAB-LP-05 cable can be used to connect the power supply to the controller. Connect the Brown/White pair to +24 Vdc and the Blue/Black pair to 0 V- (GND).

Sync In/Sync Out

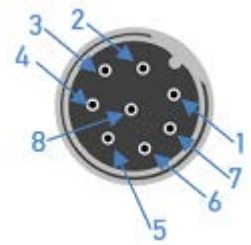
One Sync In and one Sync Out port can be used to connect multiple scanners and cameras together. Common applications may connect multiple cameras in a SyncNet loop. See **“Accessories” on page 15** for syncnet cabling.

NOTE: Syncnet in large AV tunnels must have a completed loop. Sync cables must be kept as short as possible. Failure may cause tachometer errors in the tunnel.

SYNC IN

M12 5P FEMALE	PIN	FUNCTION
	1	RS485 IN RX-
	2	RS485 IN TX+
	3	RS485 IN TX-
	4	ETNERNET TX+
	5	ETHERNET RX+
	6	ETNERNET TX-
	7	RS485 IN RX+
	8	ETHERNET RX-

SYNC OUT

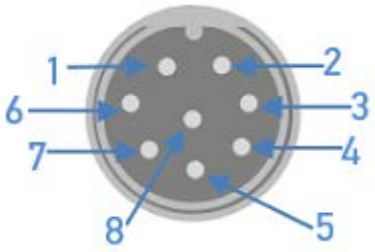
M12 5P MALE	PIN	FUNCTION
	1	RS485 OUT TX-
	2	RS485 OUT RX+
	3	RS485 OUT RX-
	4	ETNERNET RX+
	5	ETHERNET TX+
	6	ETNERNET RX-
	7	RS485 OUT TX+
	8	ETHERNET TX-

Ethernet Interface

Two standard EBC M12 4 pole D-Coded female connectors are provided on the SC5100 for Ethernet connections, labeled EBC1 and EBC2. These are reserved for building EBC clusters, typically cluster members are DS8110 and DX8210 scanners. This interface is IEEE 802.3 10 BaseT and IEEE 902.3u 100 Base Tx compliant.

Gigabit Ethernet

Four standard Ethernet M12 8-pin A-Coded female connectors are provided on the SC5100's upper cover for the Ethernet Connections: ETH1, ETH2, ETH3, and ETH4 are used as general purpose Gigabit Ethernet ports which can be used for Host connection as well as connecting other Ethernet accessories (Scale, DC3000, WebSentinel, etc.). Ïhis interface is IEEE 802.3ab 1000BASE-T, IEEE 802.3u 100BASE-TX, and IEEE 802.3az 10BASE-Te compliant. (See attachment for figure to the right)

M12 8P A CODED FEMALE	PIN	SIGNAL
	1	Data_3-
	2	Data_4+
	3	Data_4-
	4	Data_1-
	5	Data_2+
	6	Data_1+
	7	Data_3+
	8	Data_2-

SD Card Slot

Open the access panel to view the external SD Card slot which is used for storing the SC5100 software and configuration. The slot supports a standard size SD card.

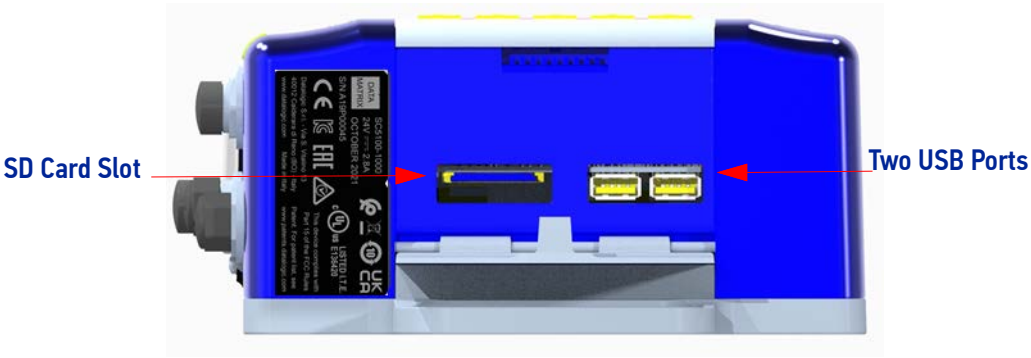


WARNING: Disconnect power to the SC5100 before removing the SD Card.

To remove the SD card, push in on the card until a click is heard. The card can then be pulled out. To reinstall, push in on the card until a click is heard and replace the USB/SD panel cover. Take extra care to follow safety procedures to avoid ESD damage to the exposed connections under the USB/SD panel on the side of the SC5100.

USB

The SC5100 has two USB Connectors which support USB 2.0 standard. These USB ports can be used to support handheld scanning devices.

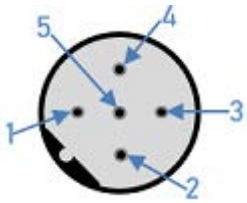


Profibus Interface

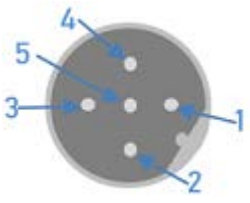
The Profibus interface is only available in the SC5100-100B and SC5100-102B Profibus model and allows inserting the controller in a Profibus network.

A pair of Male and Female M12 5-pin B-Coded connectors are provided on the SC5100's right-most front panel for Profibus connections.

Water Tight Connectors



Profibus In M12 5P Male (B-coded)	
Pin	Function
1	+5V Bus
2	A Line (-)
3	GND Bus
4	B Line (+)
5	Shield



Profibus Out M12 5P Female (B-coded)	
Pin	Function
1	+5V Bus
2	A Line (-)
3	GND Bus
4	B Line (+)
5	Shield

The Profibus interface is used for communication with a PROFIBUS DP Host and allows expanding the networking and remote diagnostic capabilities of the controller.

ONLY the last slave node on the Profibus network must be terminated and this can be done in one of two ways:

ALL Profibus slave nodes other than the last one, must have ALL the switches set to OFF.

NOTE: Bus termination switches are located on the back of the connector panel for the Profibus IP65 connection.

ONLY the last slave node on the Profibus network must be terminated and this can be done in one of two ways:

1. **Connect a standard Profibus terminator onto the M12 Female connector, (i.e Lumberg "SAC-5P-M12MS PB TR" terminator). In this case ALL the buss termination switches must be OFF.**
2. **If no standard Profibus terminator is used, set ALL the bus termination switches to ON. In this case install a connector plug onto the M12 Female connector to maintain the IP rating.**

ALL Profibus slave nodes other than the last one, must have ALL the switches set to OFF.

Profinet Interface

The Profinet interface is only available in the SC5100-100N and SC5100-102N Profinet model and allows inserting the controller in a Profinet-IO network.

Two standard M12 4-pin D-Coded female connectors are provided on the SC5100's rightmost front panel for Profinet connections.



Ethernet Network Connector Pinout		
Pin	Name	Function
1	TX +	Transmitted data (+)
2	RX +	Received data (+)
3	TX -	Transmitted data (-)
4	RX -	Received data (-)

The Profinet interface is used for communication with a PROFINET-IO Host and allows expanding the networking and remote diagnostic capabilities of the controller.

CBX CONNECTION BOX WIRING

WARNING: DO NOT connect a separate power source to the CBX connection box. The CBX receives its power through its connection to the SC5100. Connecting a separate power source will be detrimental to the system operation.

As shown below, loose-lead cables must pass through the water-tight seals in the base of the CBX connection box (CBX100 shown). Insert the cables allowing enough slack for the individual wires to reach the appropriate pin block connectors. Securely tighten the water-tight seals after the cables have been inserted.

Insulation on individual wires should be removed to expose 13 mm [0.5 in] of bare metal before inserting into the pin block.

Selecting the Correct CBX Connection Box for Your Application

Typical applications require a single CBX connection box to connect the trigger and encoder inputs to the controller. The SC5100 controller sources power to these devices. Other possible CBX connections are for digital outputs or a serial host. The **CBX100** and-**CBX510** each provide different input and output signals. Applications Engineering and you will select the correct box based on the needs of your application.

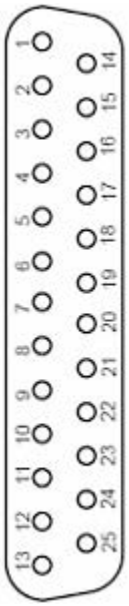
SC5100 TO CBX CONNECTIONS

Two ports are available for attaching to CBX connection boxes. The wiring for these two ports is illustrated below.



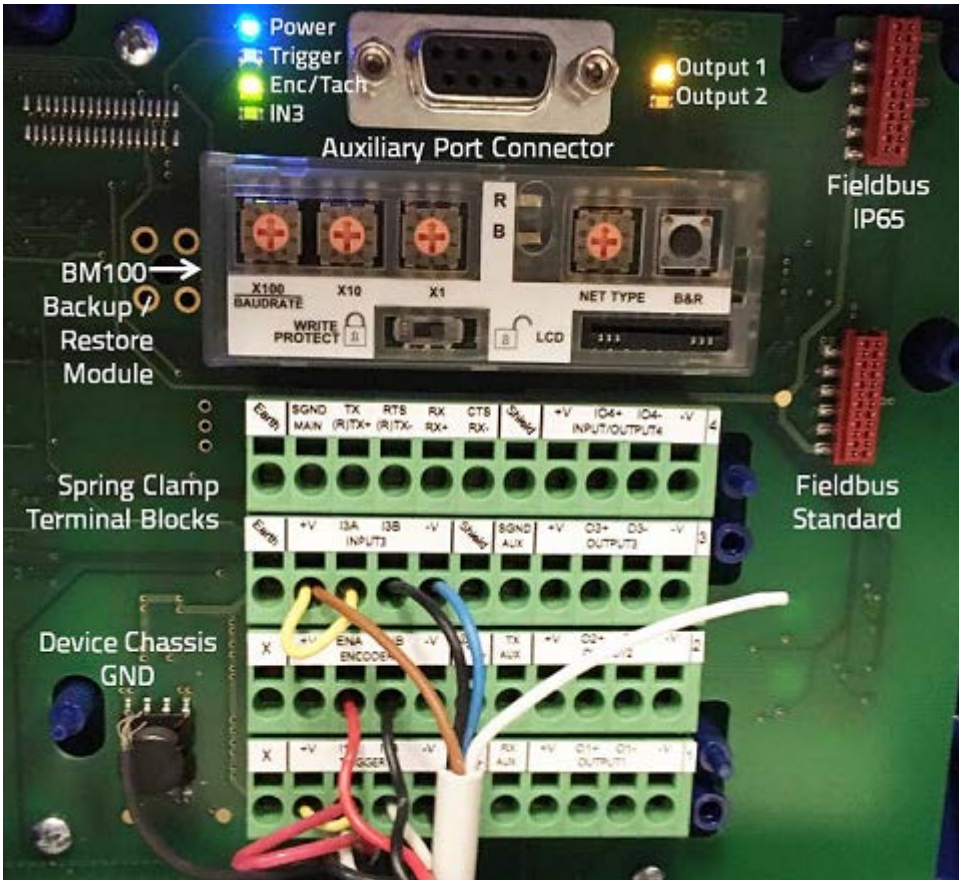
NOTE: WB CONN must be connected to GND on each CBX Port for V+ to be active In1.

In2 is used for Trigger and Encoder respectively on CBX1 only.

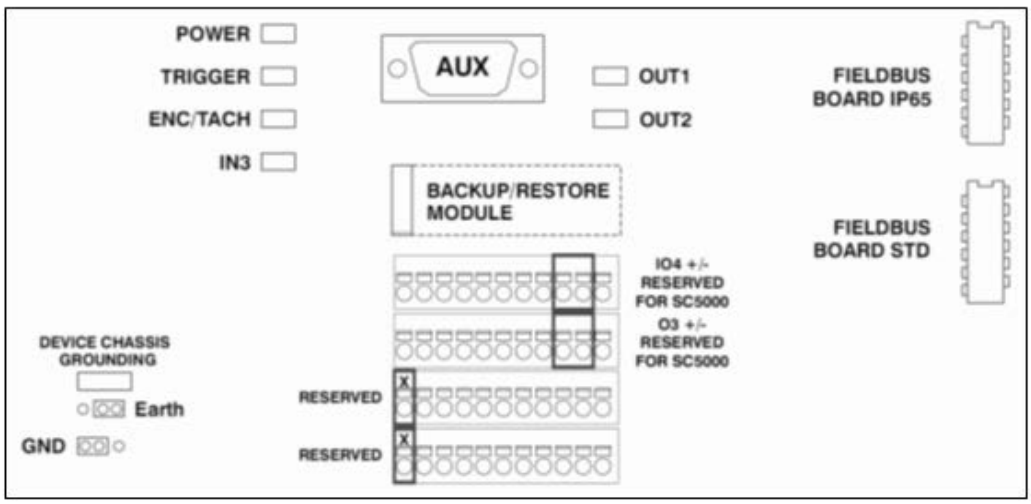
25P D SUB CONNECTOR	PIN	SIGNAL
	1	Chassis GND
	2	Main TX/TX+
	3	Main RX/RX+
	4	Main RTS/TX-
	5	Main CTS/RX-
	6	In2+ (Encoder+ on CBX1)
	7	Main Serial SGND
	8	Out1+
	9	IO4+
	10	In2- (Encoder-on CBX1)
	11	Out2+
	12	Out2-
	13	V+
	14	In3+
	15	IO4-
	16	Out3+
	17	Out3-
	18	In1+ (Trigger+ on CBX1)
	19	In1- (Trigger- on CBX1)
	20	Aux Serial RX
	21	Aux Serial TX
	22	Out1-
	23	WB CONN
	24	In3-
	25	GND

CBX CONNECTION BOX INITIAL CONFIGURATION

Complete installation information on these connection boxes is available in the **CBX Box Installation Manuals** available at www.datalogic.com.



WARNING: If you are terminating more than one wire in a single terminal, cut off any tinned ends and twist the wires together before inserting them into the terminal.



Photoelectric Sensor Connections to CBX510

Barcode scanning applications often use a Datalogic photoelectric sensor as a trigger device. The photoelectric sensor is wired directly into the CBX510 terminal block. If your application uses a trigger other than the one specified by Datalogic, follow the appropriate wiring diagram.

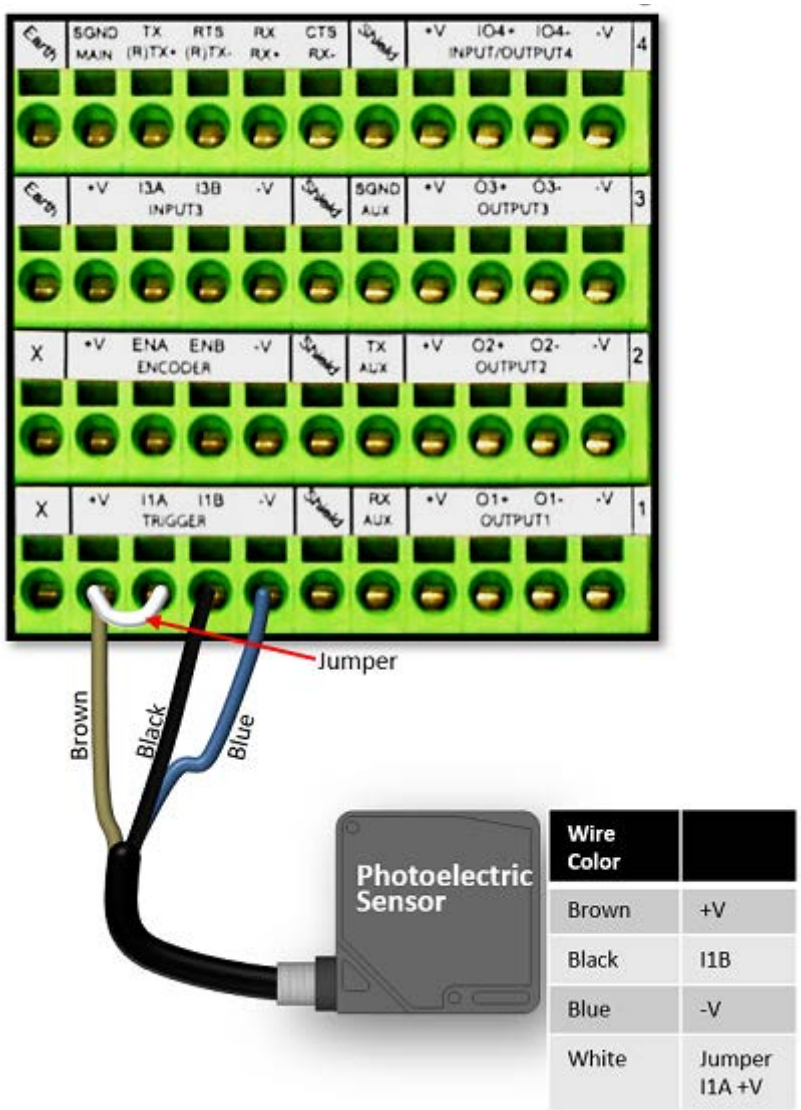
WARNING: You must use shielded interface cables with this product. To maintain FCC compliance the cable shield must make a 360 degree connection to the shielded mating connector.

NOTE: To confirm the photoelectric sensor is functioning properly, watch the TRIGGER LED first in the CBX and then on the controller while the photoelectric sensor's beam is blocked. The Datalogic photoelectric sensor also includes a status LED.

The following diagrams illustrate standard recommended wiring of the Photoelectric Sensor to the CBX510 terminal block.

Photoelectric Sensor to CBX510 (NPN)

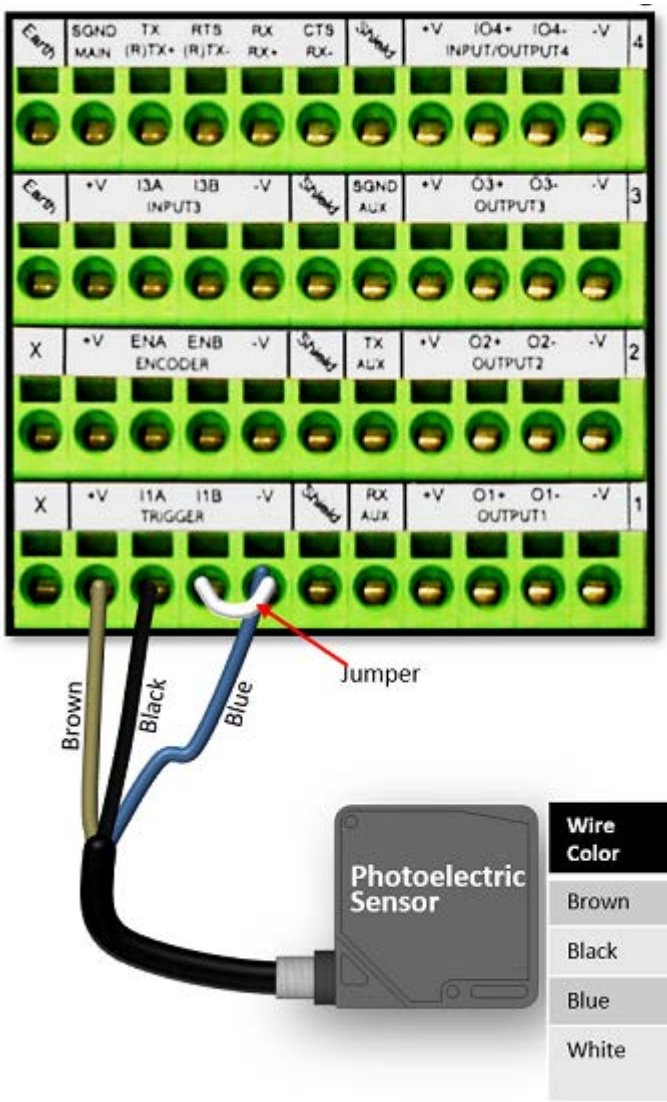
The following diagram illustrates standard recommended wiring of the Photoelectric NPN sensor in an SC5100 application to the CBX510.



Wire Color	
Brown	+V
Black	I1B
Blue	-V
White	Jumper I1A +V

Photoelectric Sensor to CBX510 (PNP)

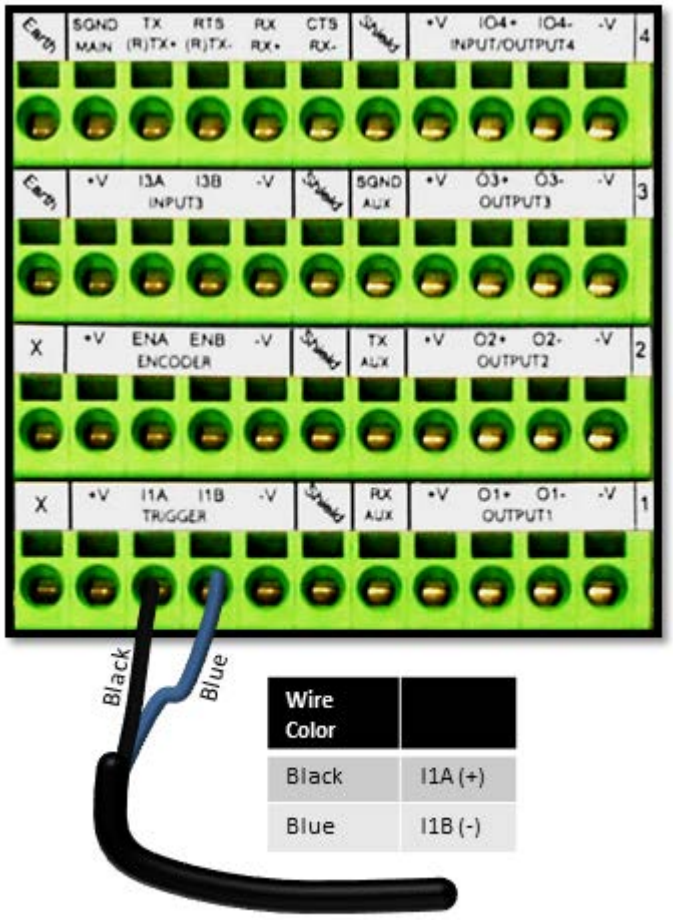
The following diagram illustrates standard recommended wiring of the Photoelectric PNP sensor in an SC5100 application to the CBX510.



Wire Color	
Brown	+V
Black	I1A
Blue	-V
White	Jumper I1B -V

24 VDC Input (from PLC)

The following diagram illustrates standard recommended wiring from a PLC to the CBX 510 in an SC5100 application.



Encoder/Tachometer Wiring to CBX510

Barcode scanning applications often use a Tachometer/Encoder. The Tachometer/Encoder is wired directly into the CBX510 terminal block. If your application uses a tachometer follow the appropriate wiring diagram.

NOTE: The Encoder/Tachometer signal can only be configured on CBX Port1 of the SC5100. Therefore the Encoder/Tachometer must be connected to the CBX connected to the SC5100 Port 1.

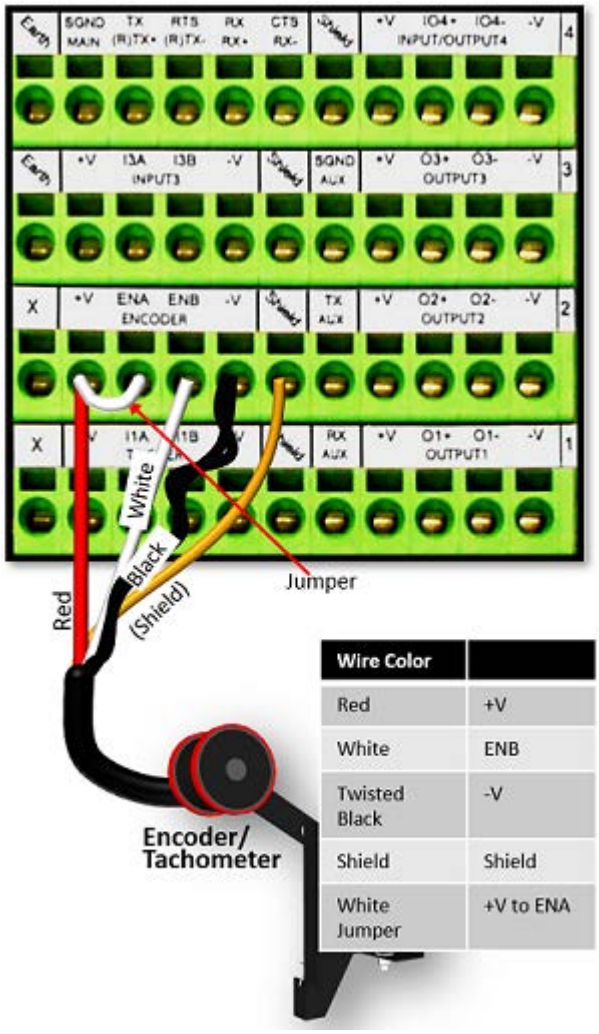
Encoder/Tachometer Wiring for NPN Output to CBX510

WARNING: Some Photocraft tachometers may have a different color coding:

(+V) Red or White/Orange

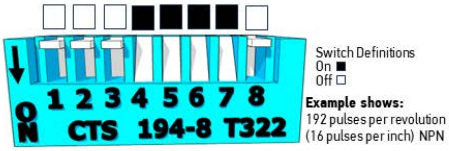
(Signal) White or White/Blue

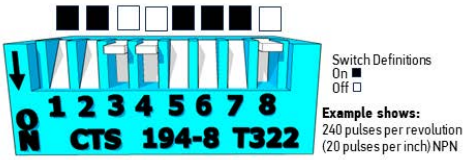
(Ground) Black or Orange/White



Wire Color	
Red	+V
White	ENB
Twisted Black	-V
Shield	Shield
White Jumper	+V to ENA

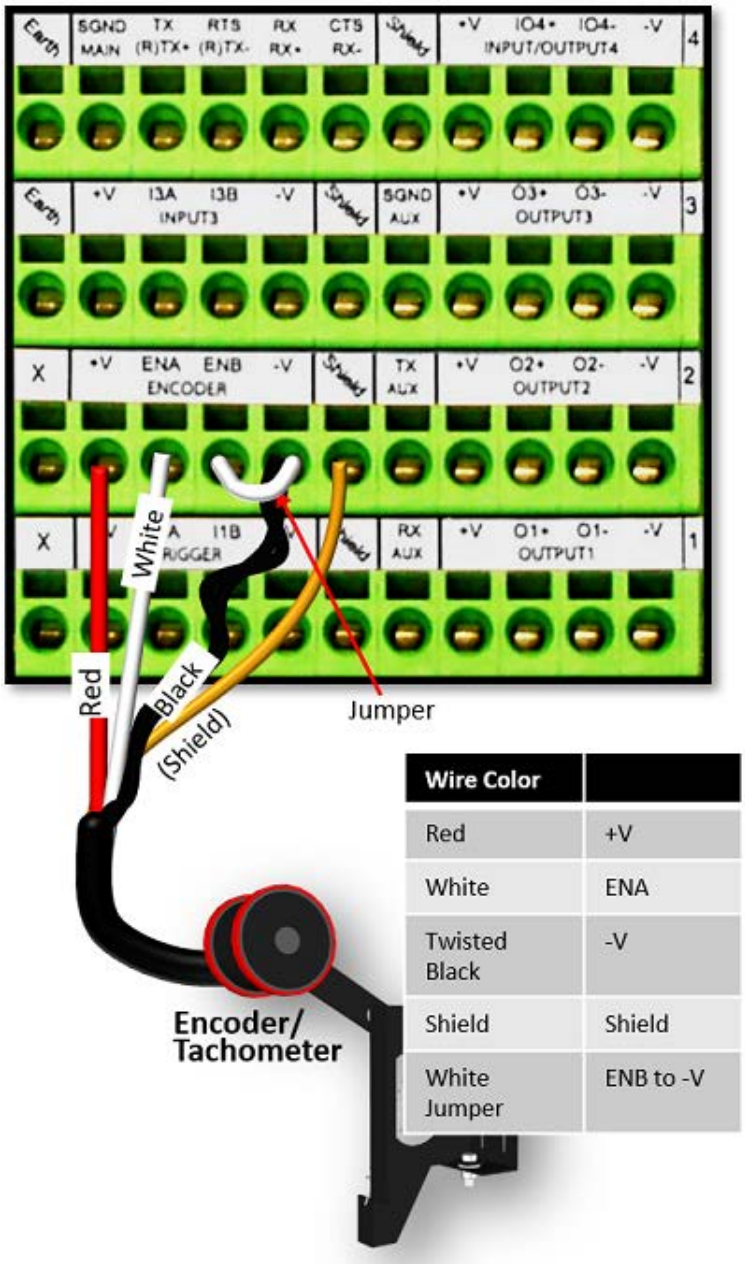
Inside the Tachometer is a switch that needs to be set to accommodate the settings of your application. The switch allows you to set the type of wiring and the pulses per revolution. For a typical system the pulses per revolution may be set to 192 or 240. In this example we are wired for NPN communications. The switch settings are shown below.





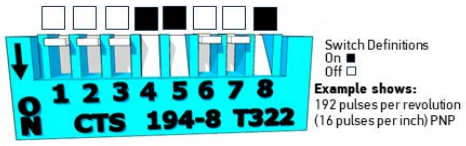
Encoder/Tachometer Wiring for PNP Output to CBX510

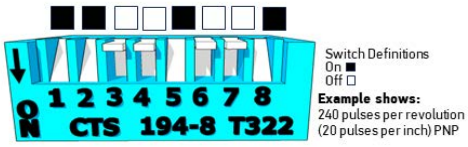
NOTE: Some Photocraft tachometers may have a different color coding:
(+V) Red or White/Orange
(Signal) White or White/Blue
(Ground) Black or Orange/White



Wire Color	
Red	+V
White	ENA
Twisted Black	-V
Shield	Shield
White Jumper	ENB to -V

Inside the Tachometer is a switch that needs to be set to accommodate the settings of your application. The switch allows you to set the type of wiring and the pulses per revolution. For a typical system the pulses per revolution may be set to 192 or 240. In this example we are wired for PNP communications. The switch settings are shown below.





Serial Communication Wiring to CBX510

The SC5100 provides serial RS232/RS422 communications to other devices through the CBX510. Each 25 pole DSUB port provides connection for RS232/RS422 communications.

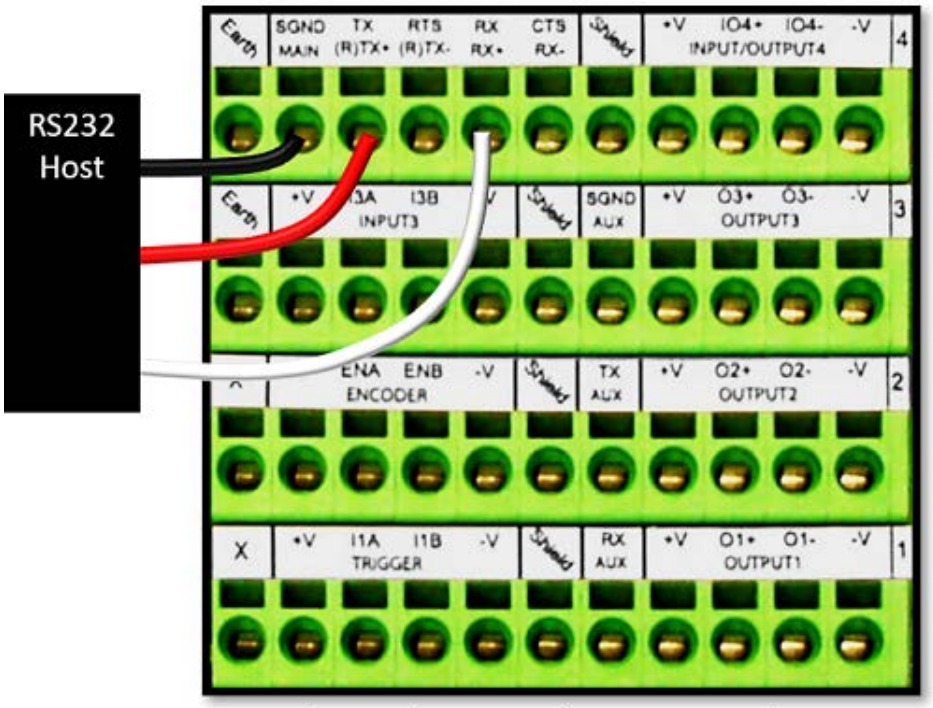
- RS232 provides point-to-point communications at distances up to 15 M [50 ft].
- RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]
- Auxiliary serial provides an alternate RS232 connection which can be used for connecting a hand held scanning device.

The following wiring diagrams illustrate the different types of serial communications available via the CBX510 terminal block. It is very important that you make the proper pin connections.

RS232 with or without Handshaking

Use RS232 for a direct connection to a controller, personal computer, or other device. RS232 provides point-to-point communications at distances up to 15 M [50 ft]. If longer cable lengths are needed, use RS422.

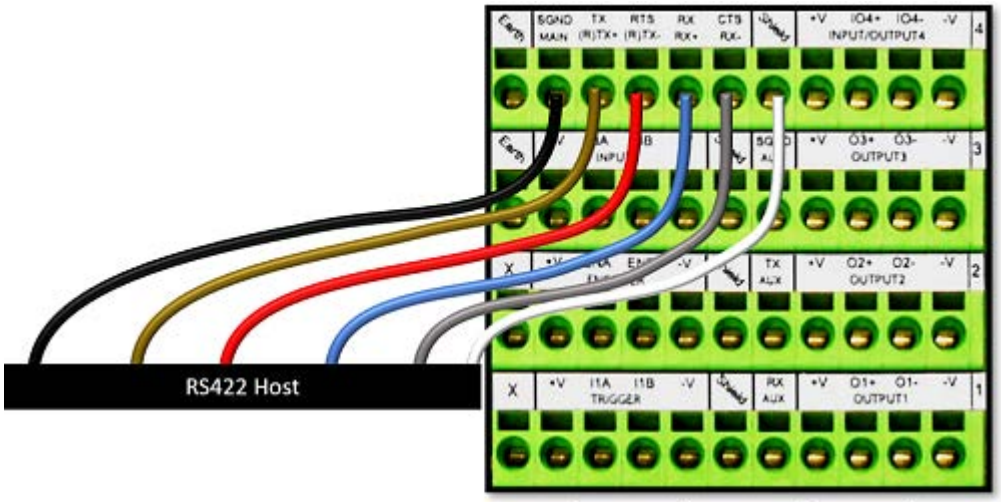
Use the following illustration as a guide when you want to connect your system to a device using RS232 communication with no handshaking.



Wire Color	Host Signal	CBX Main Terminal
Black	Signal GND	SGND
Red	Host RX	TX
White	Host TX	RX

RS422FD HOST (Full Duplex)

Use RS422 for a direct connection to a controller, personal computer, or other device. RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]. Full duplex wiring supports a four wire, double twisted pair RxD/TxD. The Signal GND and shield cables are also required as shown.

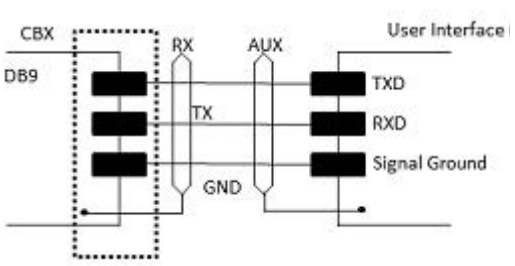


Wire Color	Host Signal	CBX Main Terminal
White	Cable Shield	Shield
Black	Signal GND	SGND
Brown	Host RX+	TX+
Red	Host RX-	TX-
Blue	Host TX+	RX+
Gray	Host TX-	RX-

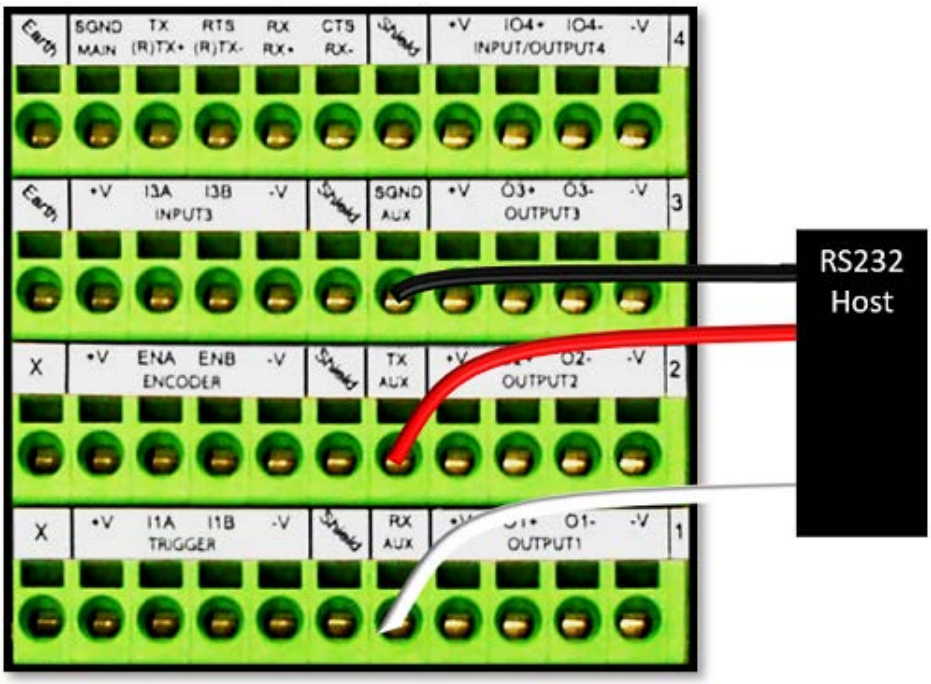
Auxiliary Serial Connections for CBX510

The auxiliary serial interface is equipped with RS232 interface connections. In addition to being an alternative serial interface, it can be used to connect hand held readers to the reading system in a pass through configuration. Data transmission can be enabled or disabled on the interface through the configuration parameters.

Pin	Name	Function
2	TX	Transmit
3	RX	Receive
5	GND	Ground



The 9-pin connector is normally used for quick/temporary connection. For a more permanent connection you can also use the CBX Box's spring clam connectors, in particular the positions labeled RX, AUX, TX and SGND AUX.

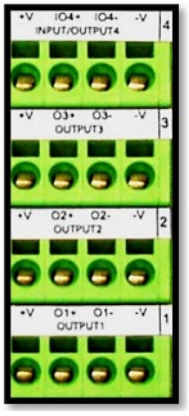


Wire Color	Host Signal	CBX Aux Terminal
Black	Signal GND	SGND
Red	Host RX	TX
White	Host TX	RX

Digital Output Configuration from CBX510

The CBX510 includes an OUTPUTS block for wiring relays as needed for external accessories. Output 4 is shared with Input 4, so it must be configured correctly using e-Genius setup.

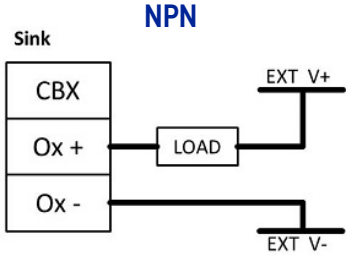
Outputs 1 - 4
Maximum Voltage 30V
Collector Current (pulse) 130 mA Max.
Collector Current (continuous) 40 mA Max.
Saturation Voltage (VCE) 1V at 10 mA Max.
Max. Power Dissipation 90 mW at 50 degrees C ambient temperature.



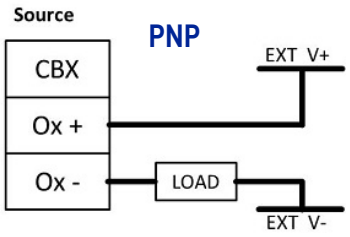
Schematics for Isolated and Non-Isolated digital outputs are provided below.

Unpowered Outputs

NPN

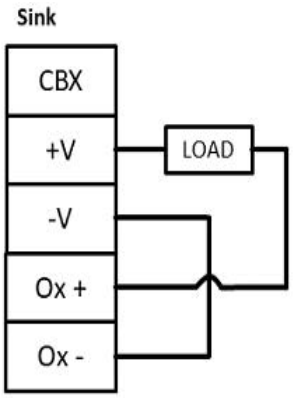


PNP

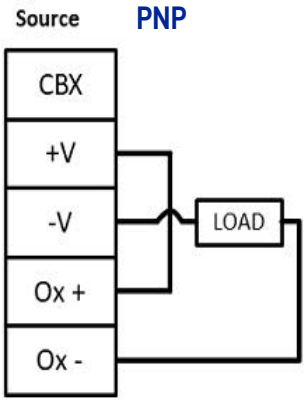


Powered Outputs

NPN



PNP



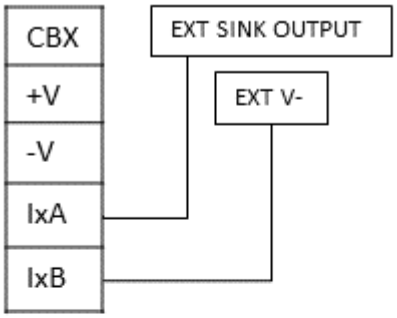
General Use Digital Input Configuration from CBX510

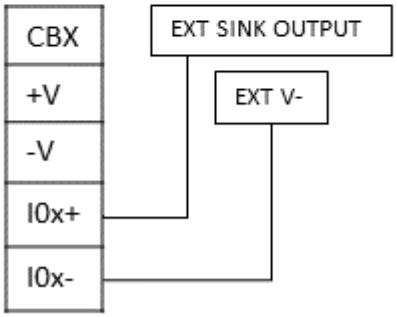
The CBX510 includes two general purpose isolated inputs, INPUT3 and INPUT/OUTPUT4. INPUT4 is shared with OUTPUT4 so it must be configured using e-Genius software. If a second CBX is connected to CBX Port 2 on the SC5100, all inputs on the secondary CBX become general use inputs.

Inputs 3 - 4
Operating Voltage 10-30V
Current Draw: Typical 5 mA

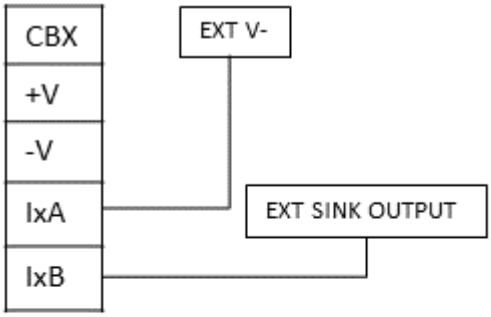


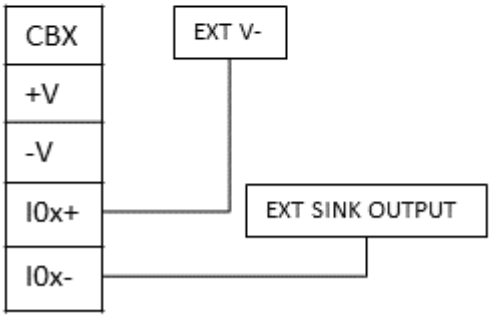
PNP





NPN





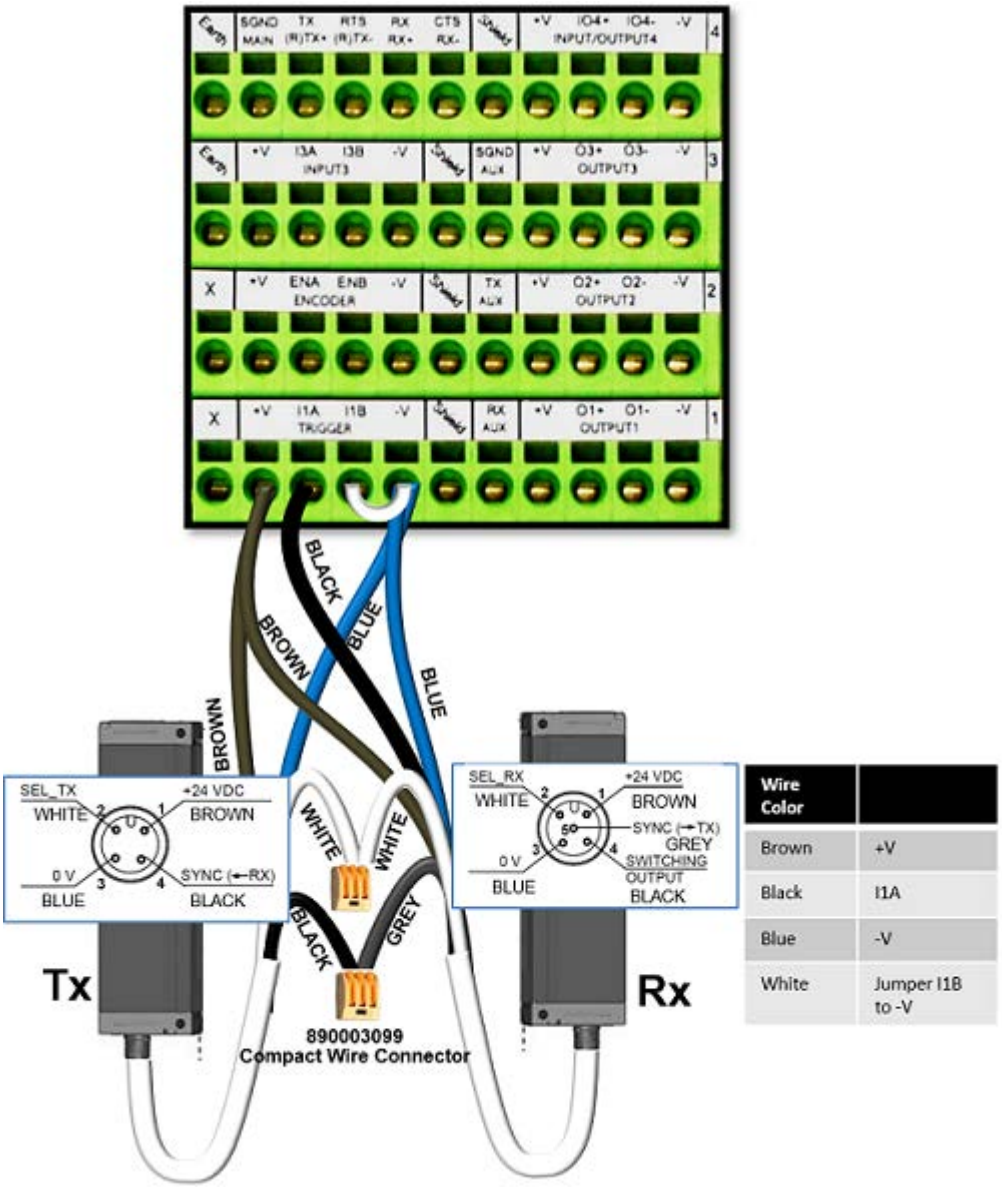
TRIGGER AND FOCUSING DEVICE WIRING

An external device can be used to trigger and/or measure the position of parcels as they enter the Field of view of a bar code reading system. This information is used by the system to determine the correct position for optimal focusing. The Datalogic focusing devices may be one of the following:

- AS1
- DK502 - S-85 Position Sensor Kit
- DM3610 Dimensioner

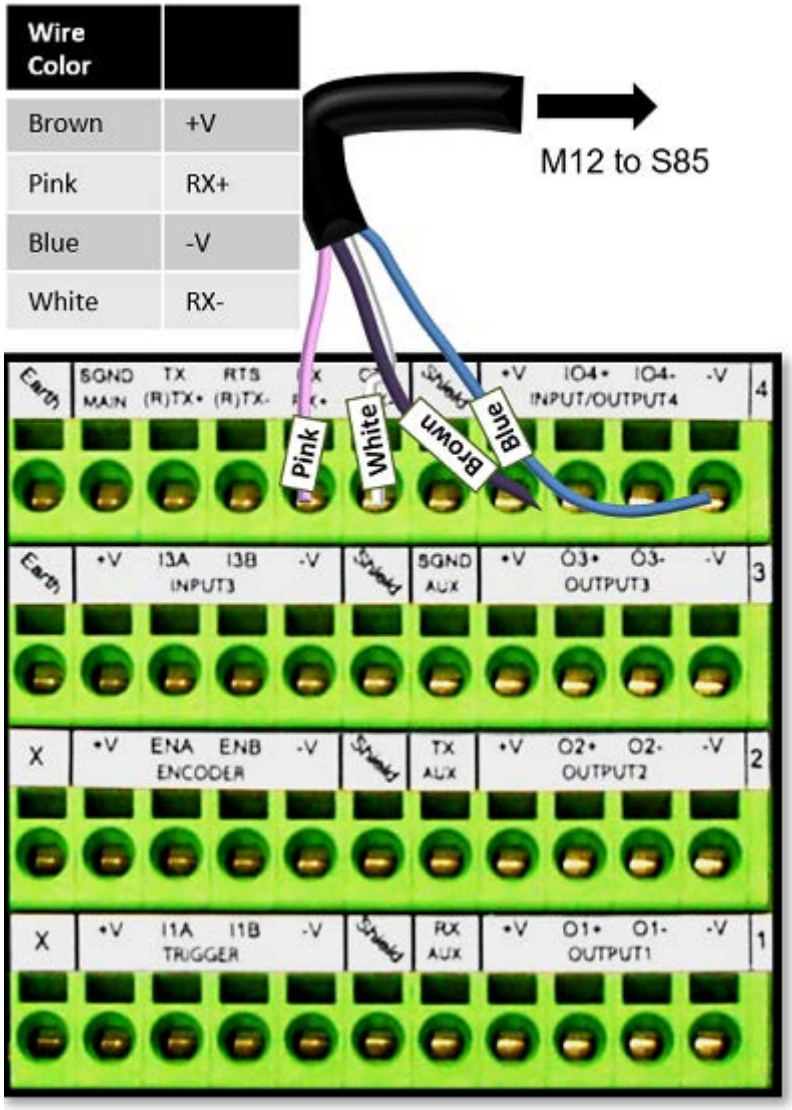
ASI

When using an AS1 for trigger, the AS1 must be wired to the CBX510 connected to the controller using a flying lead to M12 cable (FOCUS CONTROL 5MT CABLE (M12-FREE WIRES) 93A201203.)



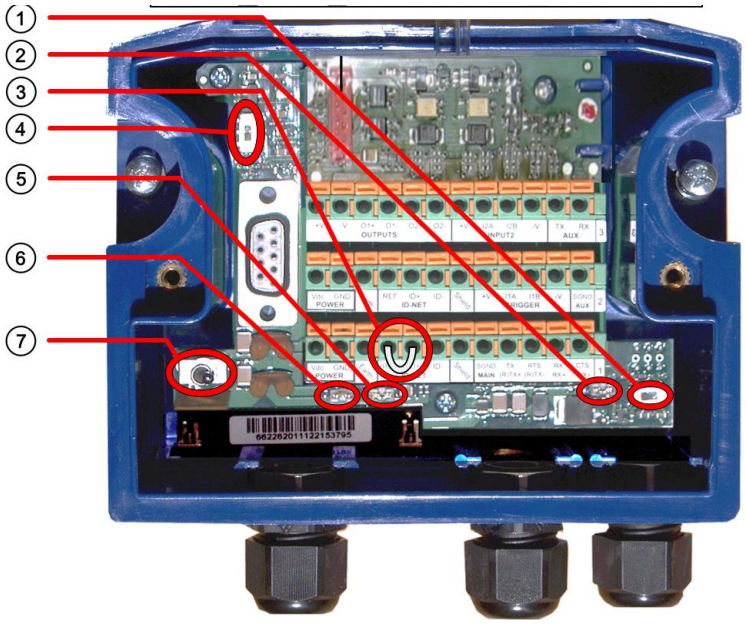
DK503 - S-85 Position Sensor

When using the S-85 for focusing, it must be wired to the CBX510 connected to the SC5100 using the cable included in the kit (95ACC1620).



CBX100

Please verify that the CBX100 connection box is configured for the SC5100 application as follows:



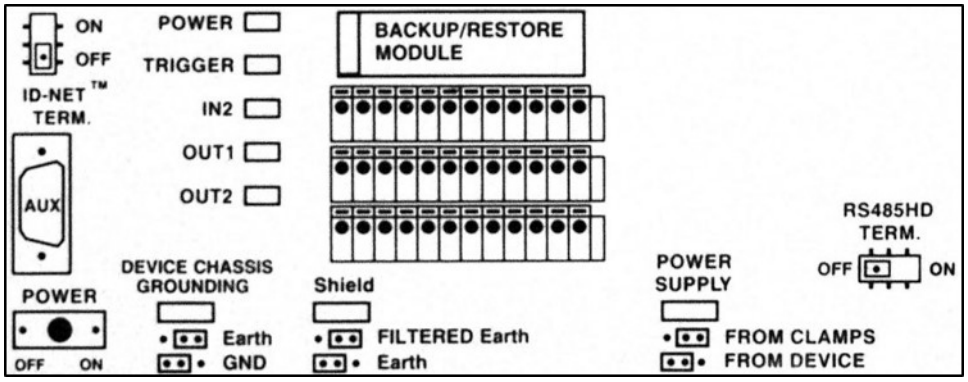
Reference the image and diagram above:

1. Set RS422HD TERM switch to OFF.
2. Set POWER SUPPLY jumper to FROM DEVICE.
3. Insert jumper wire in pin block from REF to ID+ (one jumper in either block is sufficient).

NOTE: The SC5100 will not provide power to the CBX100 unless the jumper (item number 3 in the image above) is present.

4. Set ID-NET TERM switch to OFF.
5. Set Shield jumper to FILTERED Earth.
6. Set DEVICE CHASSIS GROUNDING to Earth.
7. Set POWER Switch to ON.

Box Interior Diagram



Photoelectric Sensor Connections to CBX100

Barcode scanning applications may use a Datalogic photoelectric sensor as a trigger device. The photoelectric sensor is wired directly into the CBX100 terminal block.

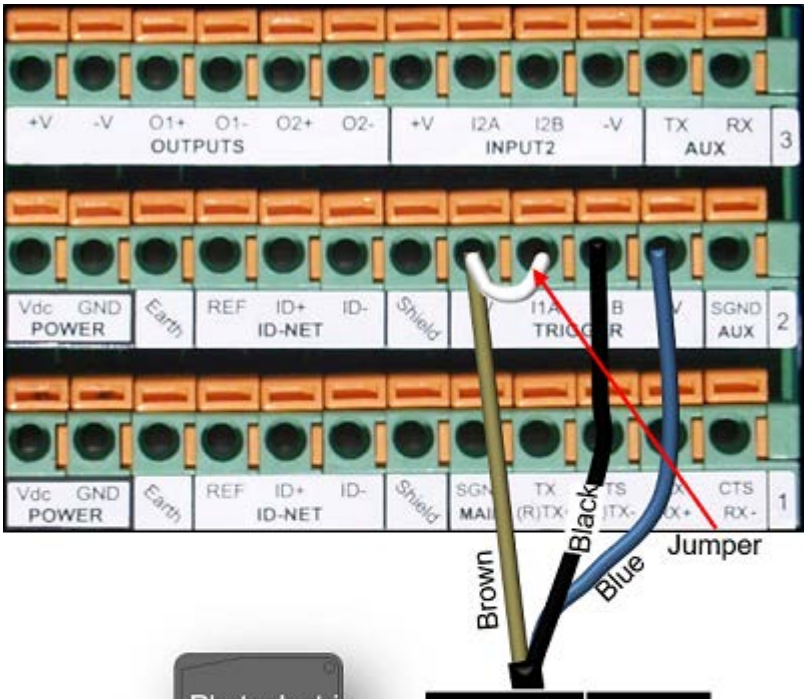
If your application uses a trigger other than the one specified by Datalogic, follow the appropriate wiring diagram to assure proper wiring.

WARNING: You must use shielded interface cables with this product. To maintain FCC compliance, the cable shield must make a 360-degree connection to the shielded mating connector.

The following diagrams illustrate standard recommended wiring of the Photoelectric Sensor to the CBX100 terminal block.

Photoelectric Sensor to CBX100 (NPN)

The following diagram illustrates standard recommended NPN wiring of the Photoelectric sensor to a CBX100 Connector box in an SC5100 application.

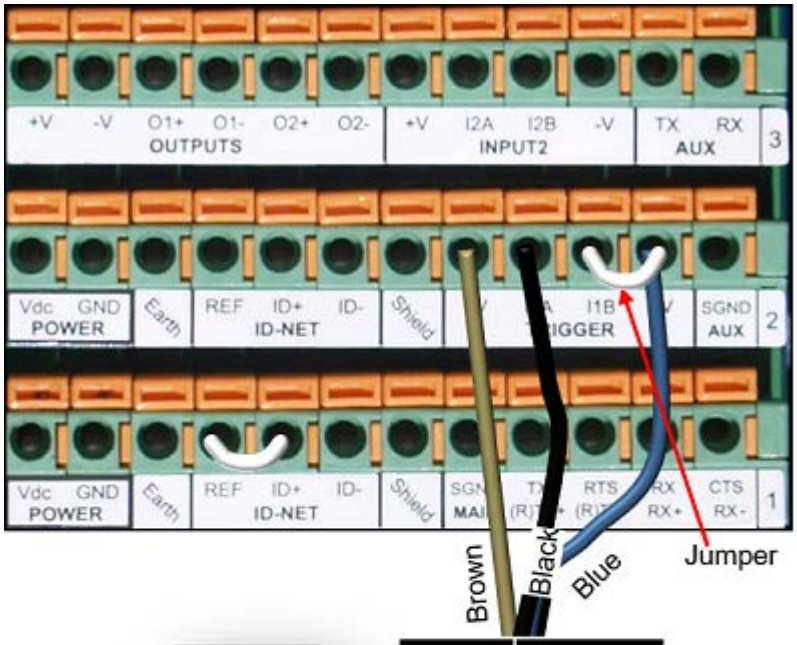




Wire Color	
Brown	+V
Black	I1B
Blue	-V
White	Jumper I1A to +V

Photoelectric Sensor to CBX100 (PNP)

The following diagram illustrates standard recommended wiring of the PNP Photoelectric sensor to a CBX100 Connector box in an SC5100 application.

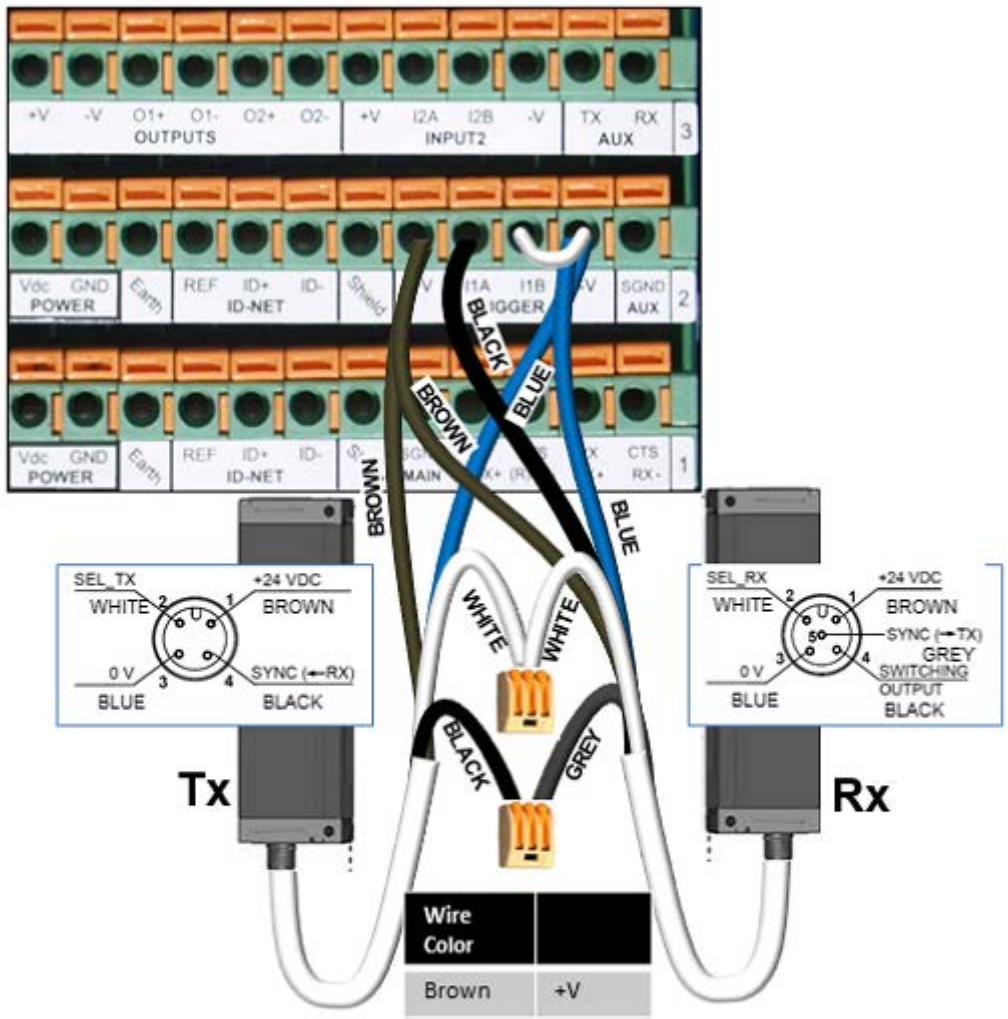




Wire Color	
Brown	+V
Black	I1A
Blue	-V
White	Jumper I1B to –V

AS1 Area Sensor to CBX100 Connections

The **AS1** area sensors can detect and provide trigger for very small or irregularly shaped objects. The following diagram illustrates standard recommended wiring of the AS1 Area Sensor to a CBX100 Connector box in an SC5100 application.



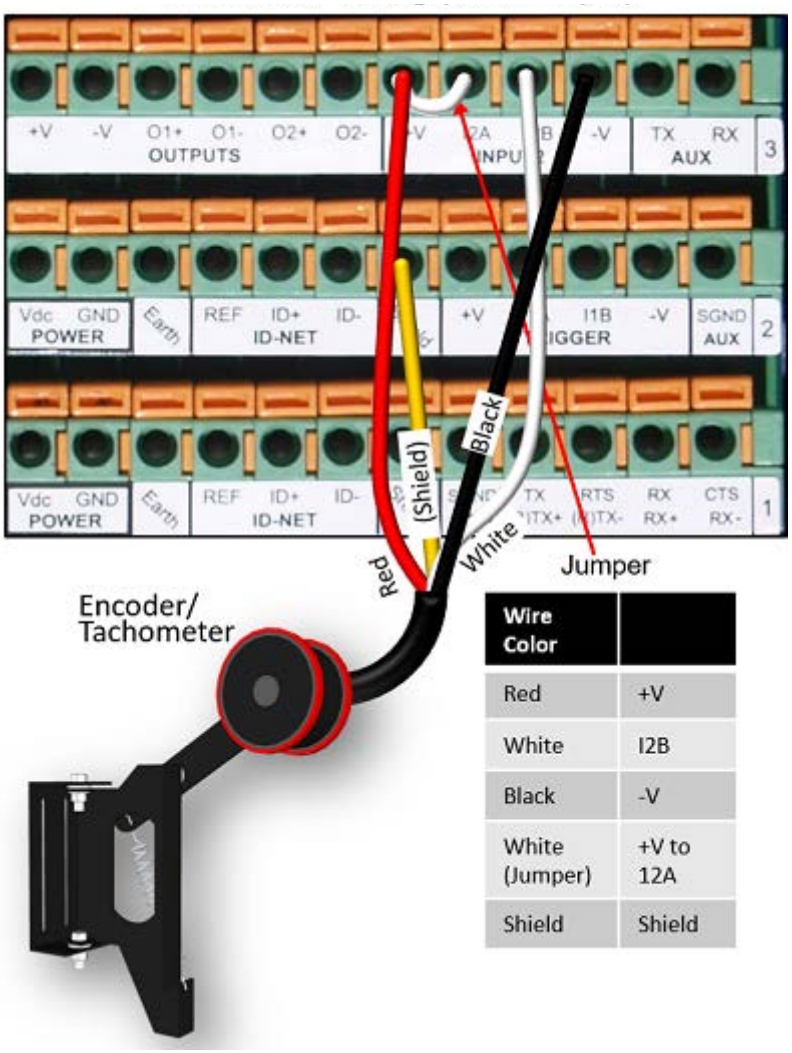
Wire Color	
Brown	+V
Black	I1A
Blue	-V
White	Jumper I1B to -V

Encoder/Tachometer Wiring to CBX100

SC5100 applications over a conveyor belt use an accessory tachometer and mounting kit. Use the cable provided with the tach to connect to the CBX terminal block as shown below.

NOTE: The Encoder/Tachometer signal can only be configured on CBX Port 1 of the SC5100. Therefore any Encoder/Tachometer signal must be connected to a CBX plugged into SC5100 CBX Port 1.

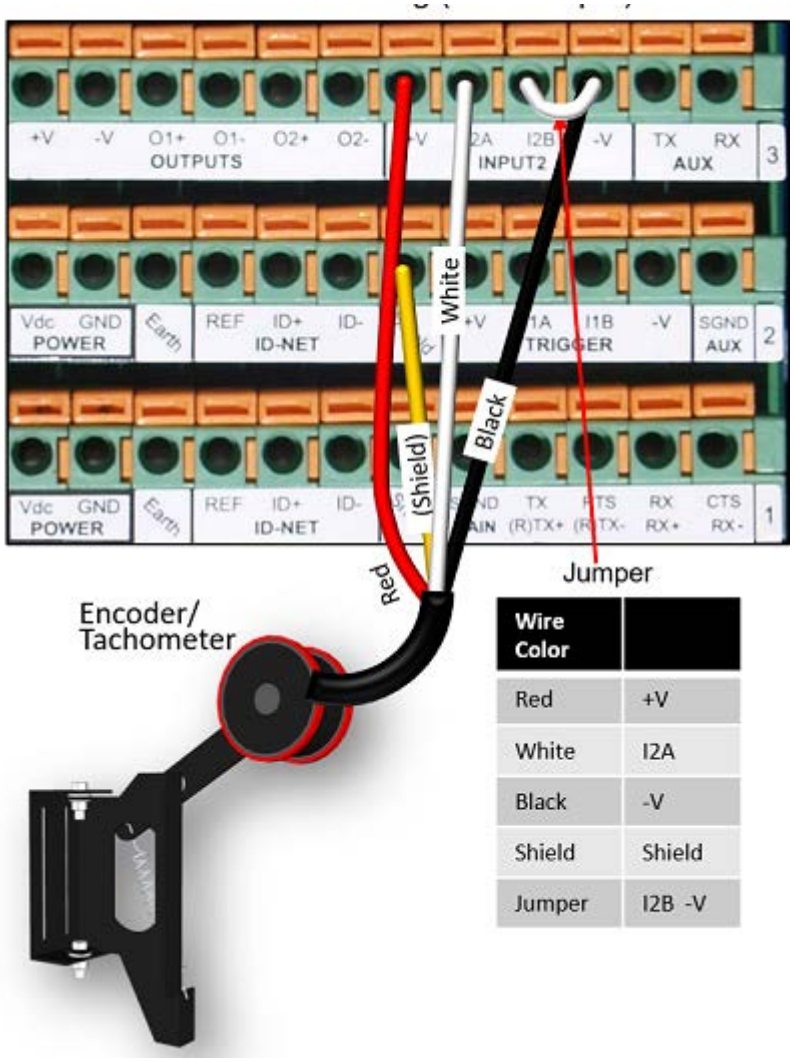
Encoder/Tachometer Wiring for NPN Output to CBX100



Wire Color	
Red	+V
White	I2B
Black	-V
White (Jumper)	+V to 12A
Shield	Shield

NOTE: Some Photocraft tachometers may have a different color coding:
(+V) Red or White/Orange
(Signal) White or White/Blue
(Ground) Black or **Orange/White**

Encoder/Tachometer Wiring for PNP Output to CBX100



Wire Color	
Red	+V
White	I2A
Black	-V
Shield	Shield
Jumper	I2B -V

NOTE: Some Photocraft tachometers may have a different color coding:
(+V) Red or White/Orange
(Signal) White or White/Blue
(Ground) Black or **Orange/White**

Serial Communication Wiring to CBX100

The SC5100 provides serial RS232/RS422 communications to other devices through the CBX100. Each 25 pole DSUB port provides connection for RS232/RS422 communications.

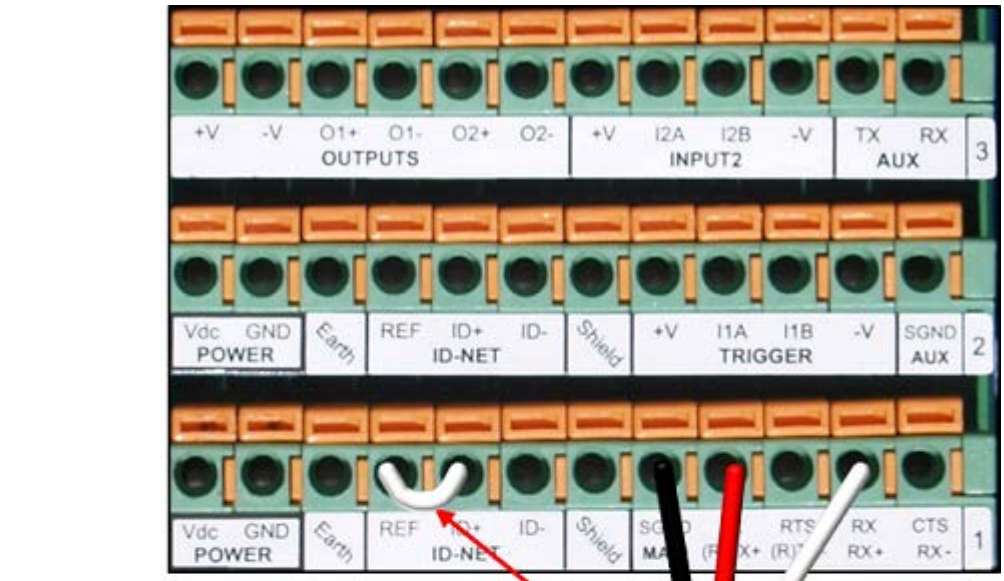
- RS232 provides point-to-point communications at distances up to 15 M [50 ft].
- RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]
- Auxiliary serial provides an alternate RS232 connection which can be used for connecting a hand held scanning device.

The following wiring diagrams illustrate the different types of serial communications available via the CBX100 terminal block. It is very important that you make the proper pin connections.

RS232 with No Handshaking

Use RS232 for a direct connection to a controller, personal computer, or other device. RS232 provides point-to-point communications at distances up to 15 M [50 ft]. If longer cable lengths are needed, use RS422.

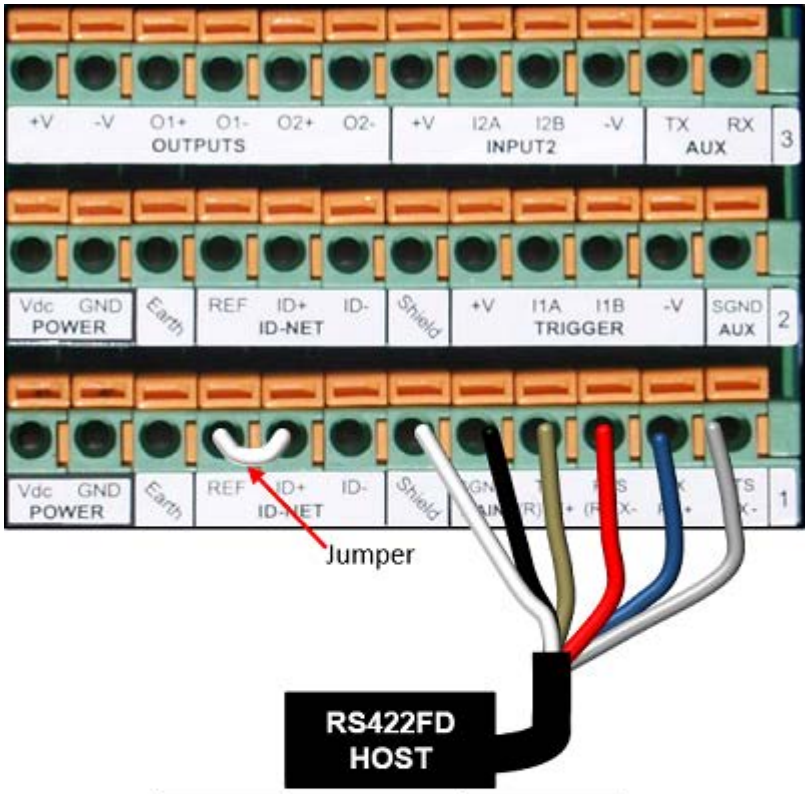
Use the following illustration as a guide when you want to connect your system to a device using RS232 communication with no handshaking.



Wire Color	Host Signal	CBX Main Terminal
White	Host TX	RX
Red	Host RX	TX
Black	Signal GND	SGND
Jumper	NA	REF to ID+

RS422FD HOST (Full Duplex)

Use RS422 for a direct connection to a controller, personal computer, or other device. RS422 provides point-to-point communications at distances up to 1200 M [3940 ft]. Full duplex wiring supports a four wire, double twisted pair RxD/TxD. The Signal GND and shield cables are also required as shown.

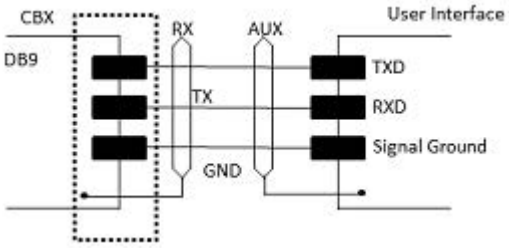


Wire Color	Host Signal	CBX Main Terminal
White	Cable Shield	Shield
Black	Signal GND	SGND
Brown	Host RX+	TX+
Red	Host RX-	TX-
Blue	Host TX+	RX+
Gray	Host TX-	RX-
Jumper	NA	REF to ID+

Auxiliary Serial

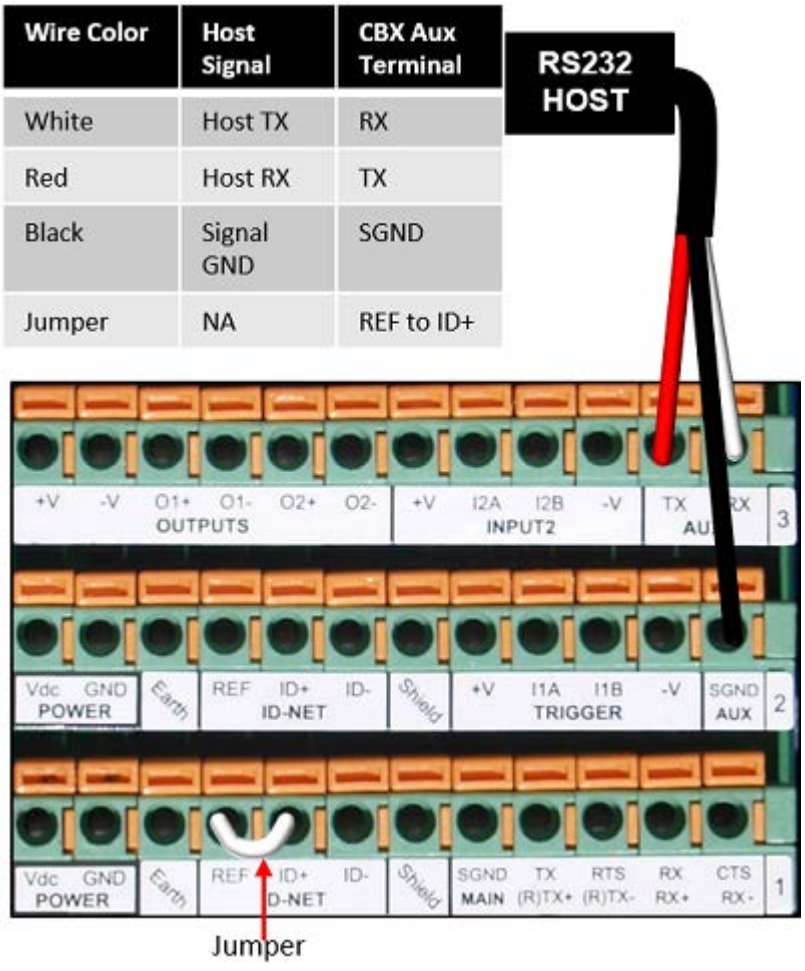
The auxiliary serial interface is equipped with RS232 interface connections. In addition to being an alternative serial interface, it can be used to connect a hand held readers to the reading system in a pass through configuration. data transmission can be enabled or disabled on the interface through the configuration parameters.

Pin	Name	Function
2	TX	Transmit
3	RX	Receive
5	GND	Ground



The 9-pin connector is normally used for quick/temporary connection. For a more permanent connection you can also use the CBX Box's spring clamp connectors, in particular the positions labeled RX, AUX, TX, AUX and SGND AUX.

Wire Color	Host Signal	CBX Aux Terminal
White	Host TX	RX
Red	Host RX	TX
Black	Signal GND	SGND
Jumper	NA	REF to ID+

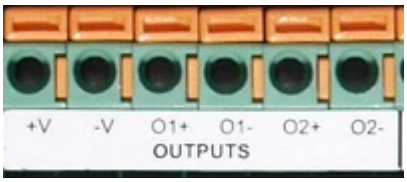


Digital Output Configuration for CBX100

The CBX100 includes an OUTPUTS block for wiring relays as needed for external accessories. e-Genius Modify | Relays window includes options for outputs 1 and 2 including Life Light, Trigger Output, Error Light, Ready Light, Good Dim, and No Dim.

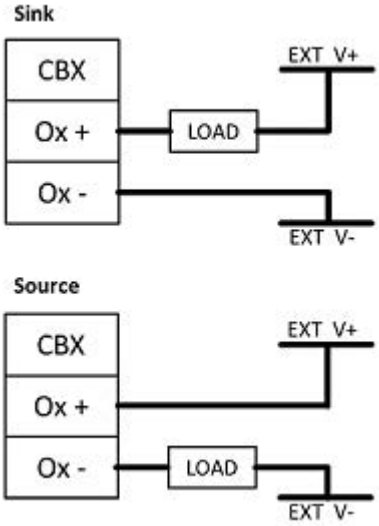
Schematics for Isolated and Non-Isolated relays are provided below.

Outputs 1 and 2
Maximum Voltage 30V
Collector Current (pulse) 130 mA Max.
Collector Current (continuous) 40 mA Max.
Saturation Voltage (VCE) 1 V at 10 mA Max.
Max Power Dissipation 90 mW at 50 degrees C (Ambient temperature)



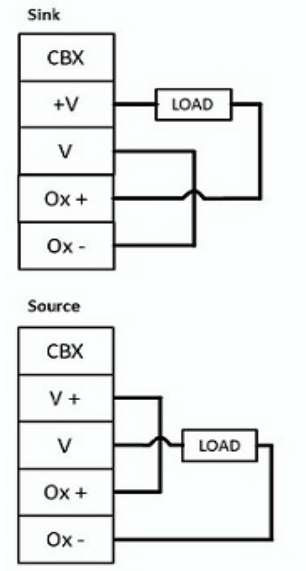
Unpowered Outputs

NPN



Powered Outputs

NPN



Grounding

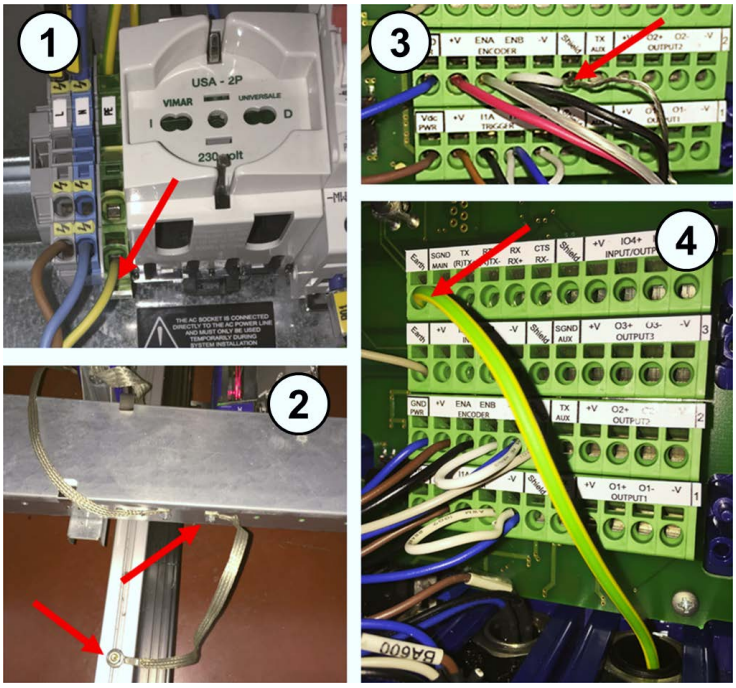
In order to avoid any problems with electrical noise that could negatively affect system function, make sure that:

1. The AC power cable coming into the PWR box is always provided with a Ground and connected to the proper connector (Protective Earth - PE).

2. The structure where the readers, controllers, encoders/tachometers, and photo-electric sensors are mounted is grounded to the conveyor or to the PE terminal inside the PWR.

3. The Shield wires from the Encoder/Tachometer and photoelectric sensor cables are connected to the proper *Shield* terminal in the CBX box.

4. Normally, steps 1 through 3 will guarantee proper function. In case of problems such as transmission of strange or wrong characters, devices stop working without any reason, or other unexpected behavior, try connecting the CBX or Controller Earth terminal to the PE terminal inside the PWR box.



TYPICAL CONNECTION BLOCK DIAGRAMS

The SC5100 is compatible with many devices. The following typical layouts refer to system hardware configurations, but also require the correct setup of the software configuration parameters. Not all of the possible configurations can be illustrated here. Other layouts may require the use of a specific SC5100 Controller model.

The accessories and cables indicated in the following figures are Datalogic products. We suggest their use to guarantee the correct system functioning.

It is important to follow these guidelines:

- Make sure to leave adequate clearances for wiring 300 mm (12in)
- Route wires carefully to reduce or minimize electrical noise
- When extraneous power and communication wiring must cross make there intersection perpendicular
- Do not run power and data wiring parallel to each other
- If possible separate power and data
- 6.5 mm (.25 in) of aluminum use steel conduit and 25 mm (1 in.) gap

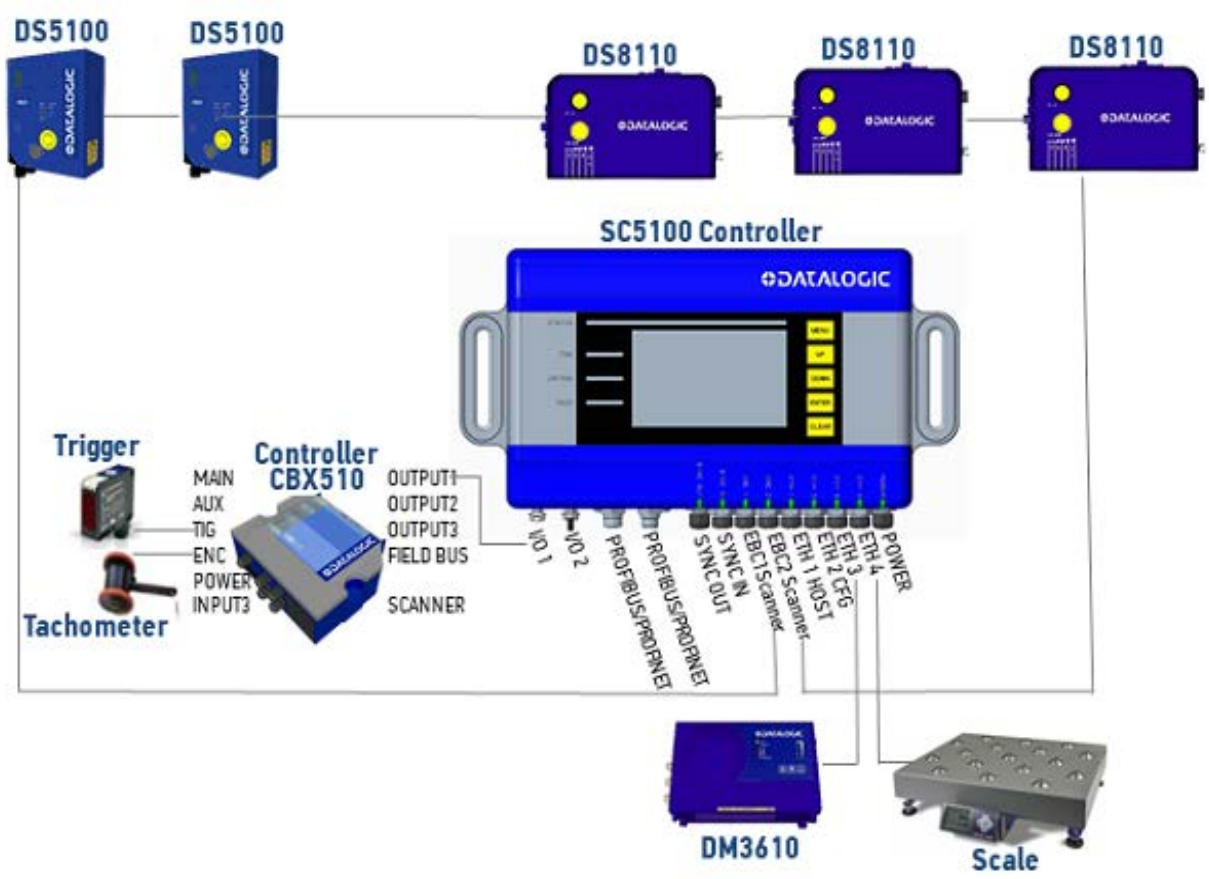
Large Synchronized Network Layout

An SC5100 can be used when building a large local EBC (Ethernet Based Connectivity) network. The SC5100 unit acts as the system master and is connected to the host through one of its interfaces.

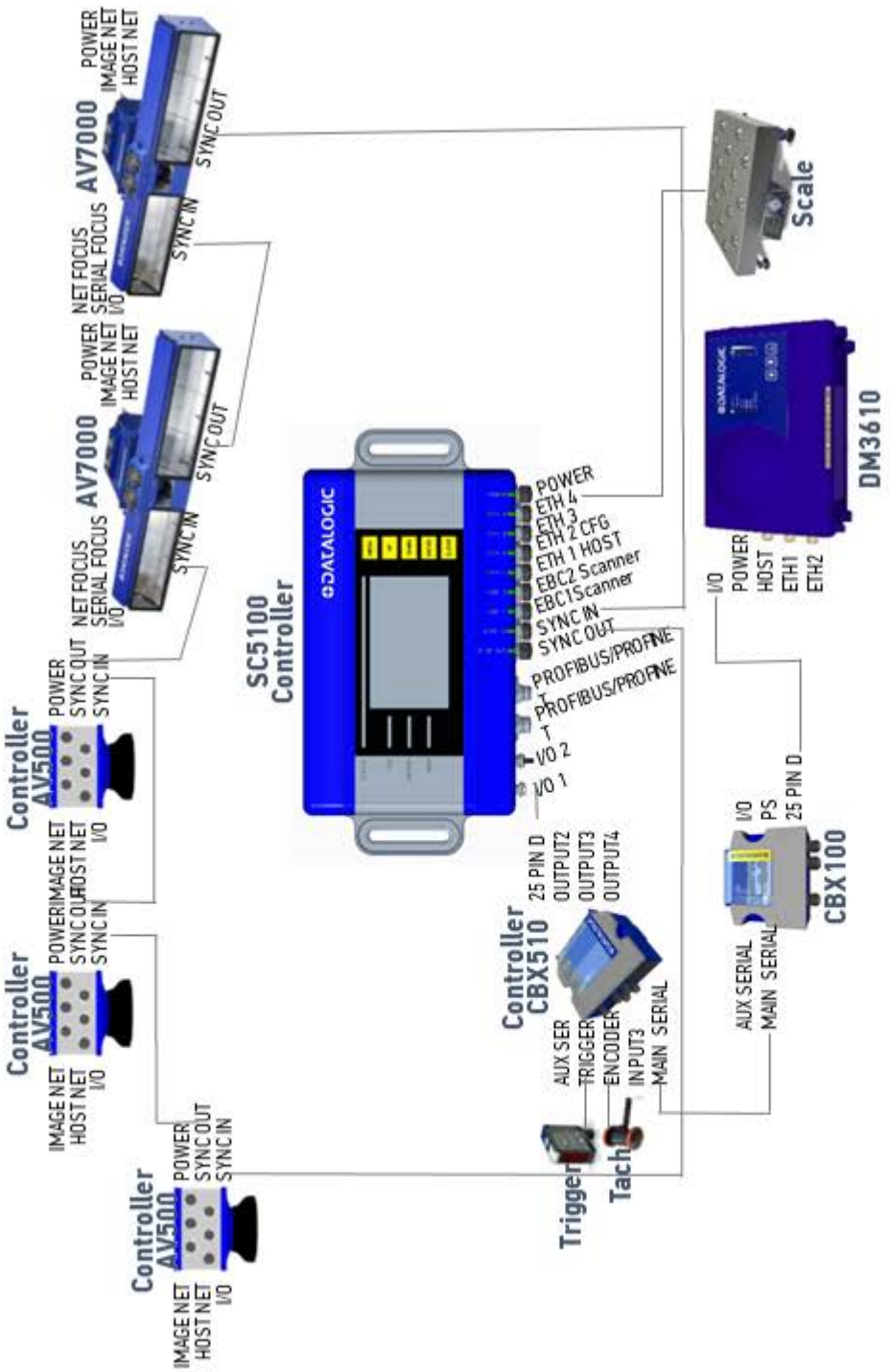
- The SC5100 can be connected to the Host in several different layouts depending on the controller model.
- The SC5100 Standard models provide both Ethernet and SyncNet connections
- Point-to-point connections are available using either RS232 or RS422 full-duplex; Fieldbus models, additionally provide the model specific Fieldbus: Profibus, Profinet

External devices such as a presence sensor and an encoder are all connected either to the CBX100, CBX510 or CBX800 connection box (connected to the SC5100), wiring the signals through the CBX510 compression connectors.

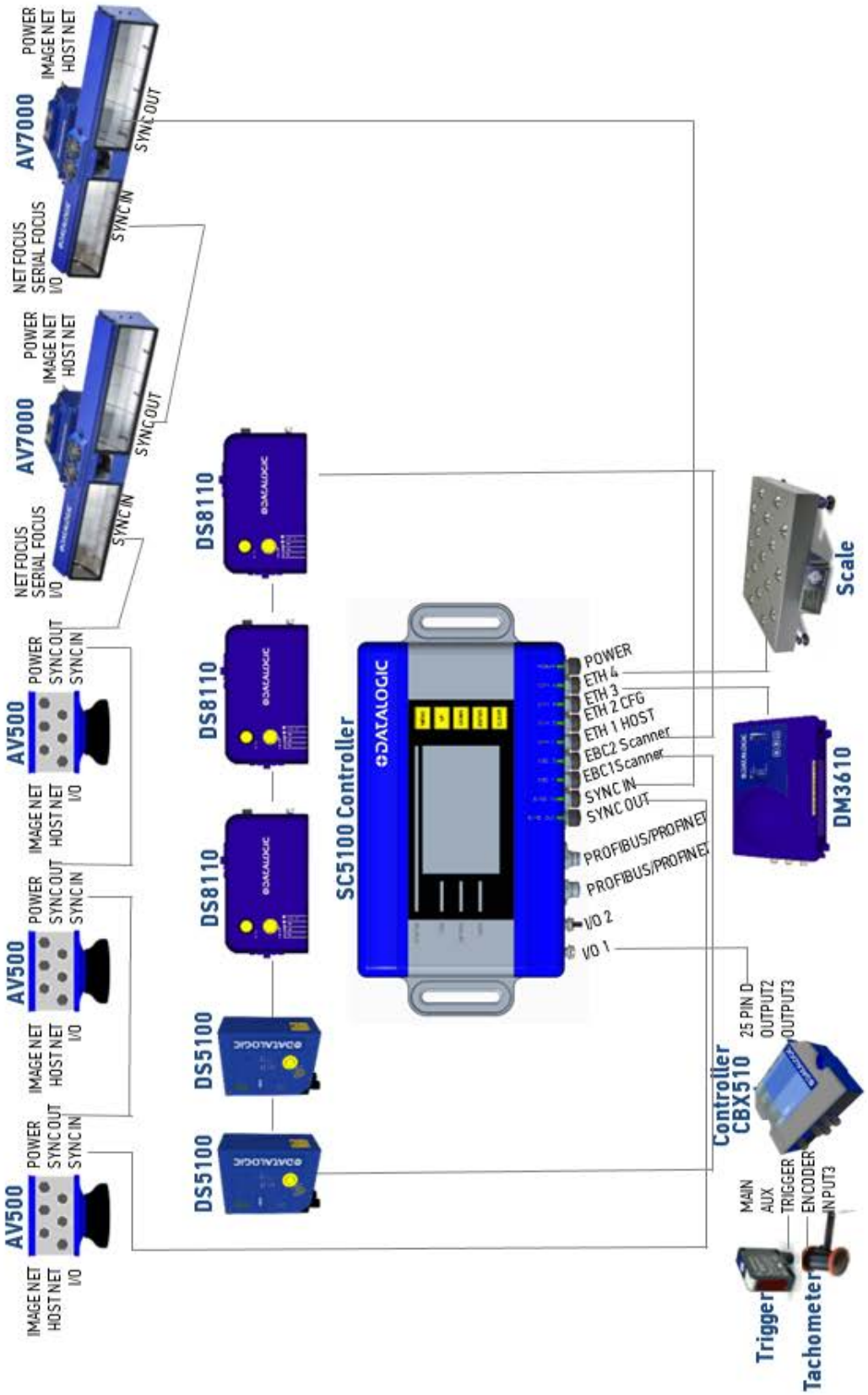
SC5100 Basic Layout 1



SC5100 Basic Layout 2



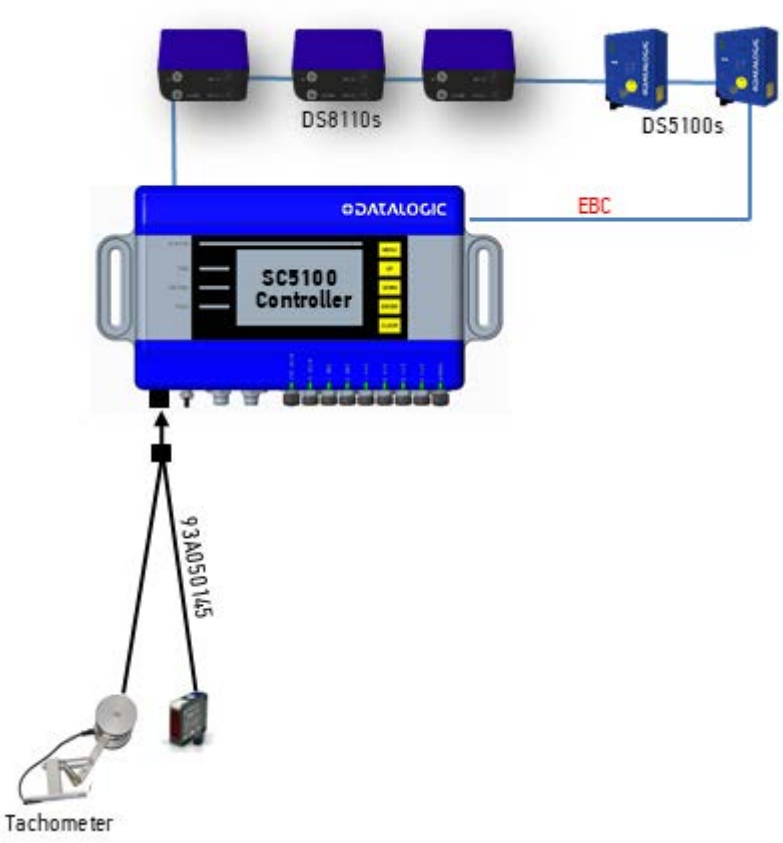
SC5100 Basic Layout 3



NOTE: Only a single SyncNet connection is required between SC5100's with no SyncNet devices.

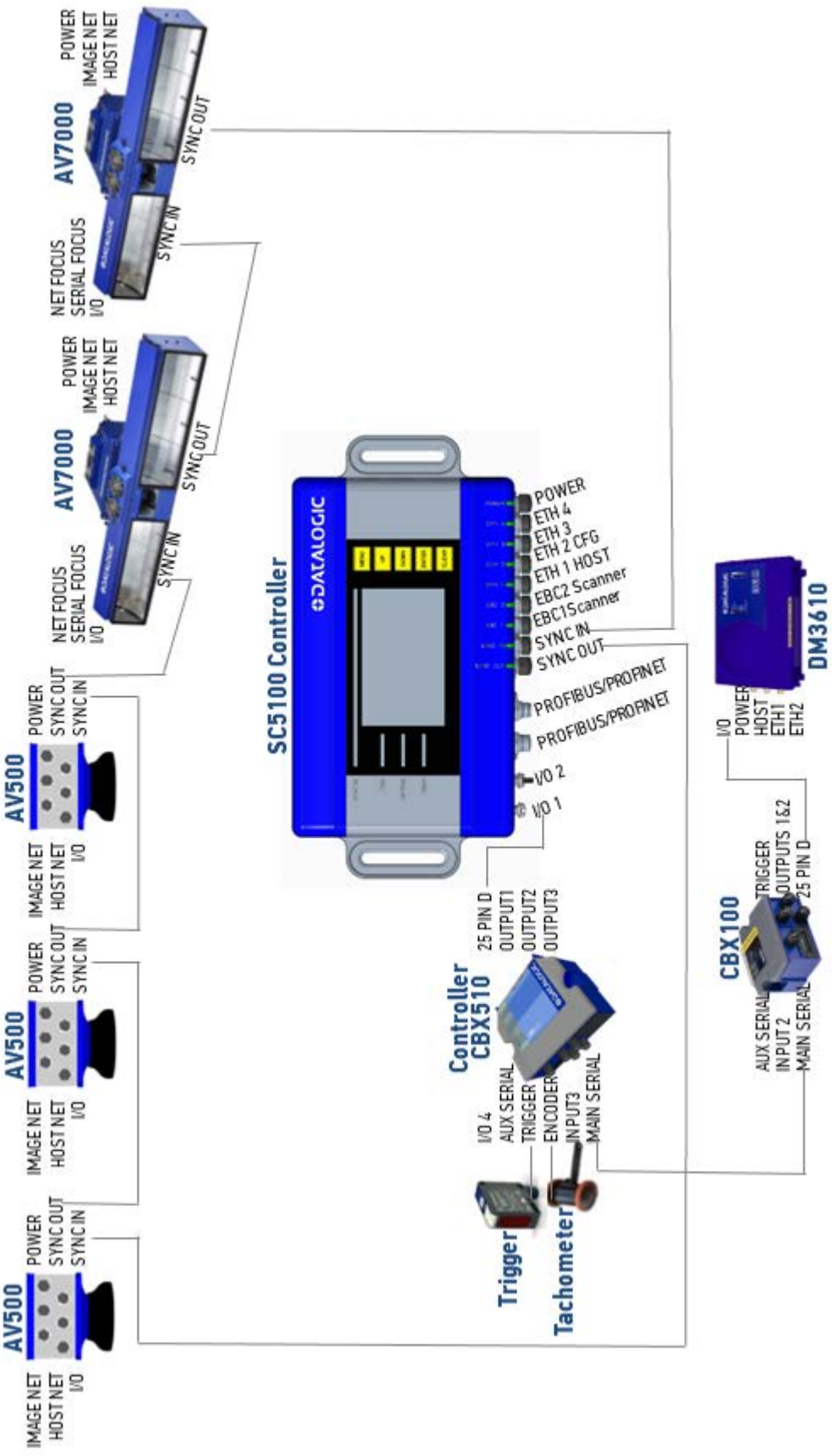
SC5100 Basic Layout 4

For some applications you use the SC5100 without a CBX. For example, a system with three DS8110s and two DS5100s. You can connect the encoder and trigger devices directly to the SC5100 using the cable 821012230 as shown below.



See PN **821012230** M12F TRIG/ENC to SC5100 Cable Quick Start Guide for details.

SC5100 Layout Using DM3610 for Focus



CHAPTER 4
REDUNDANT AND BIDIRECTONAL SYSTEMS

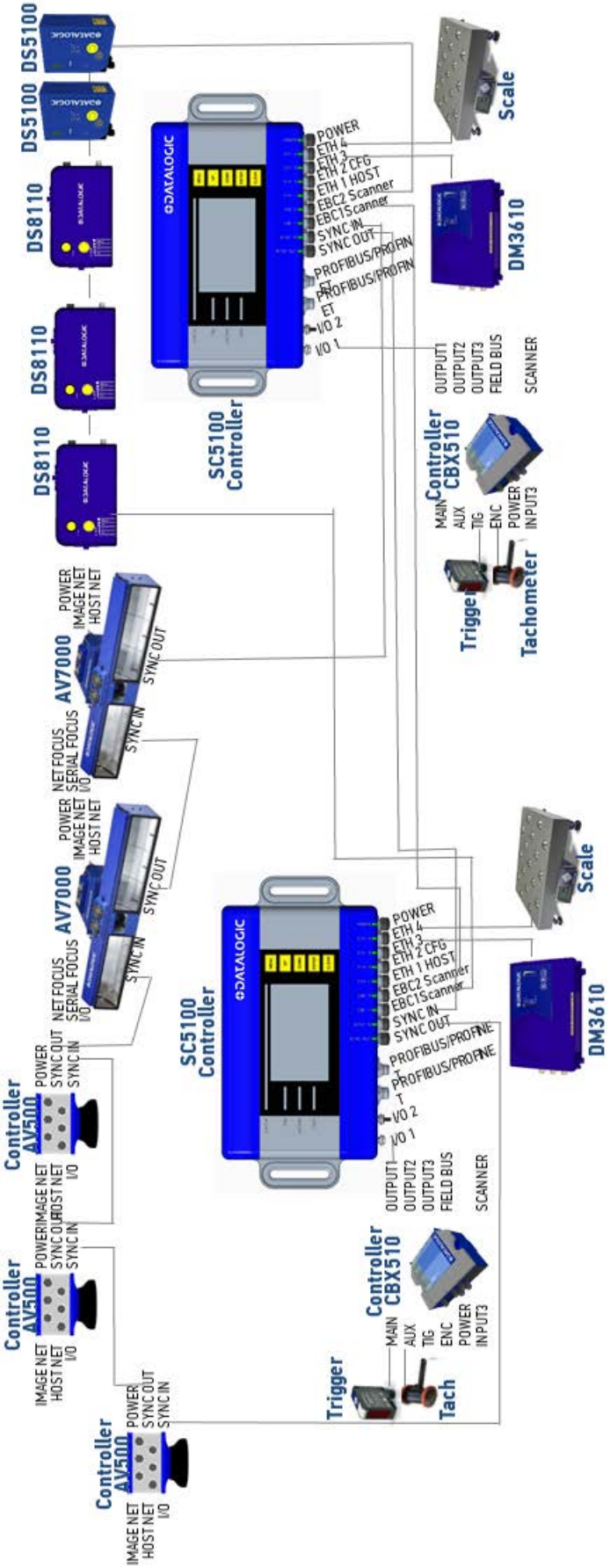
Redundant System Layout



NOTE: Operating Mode must be set to PackTrack.

A redundant system provides additional reliability in the case of SC5100 failure. It can be configured with two SC5100 Controllers used together each with their respective power supply units. All other devices are distributed equally between the PWR units. One of the SC5100 Controllers is dedicated as the **Primary** - active unit, while the other functions as a dedicated **Backup** -standby unit. The next page provides an illustration of a typical redundant system.

SC5100: Redundant System Layout with EBC and SyncNet



CONFIGURING A REDUNDANT SYSTEM

Follow these steps:

1. First complete mechanical installation.
2. Connect and wire all devices, except the backup SC5100.
3. Perform complete software configuration using e-Genius Datalogic setup software. E-Genius allows configuration and calibration of all devices in the system. Reference your individual device reference manuals for details about e-Genius configuration software for each connected product.

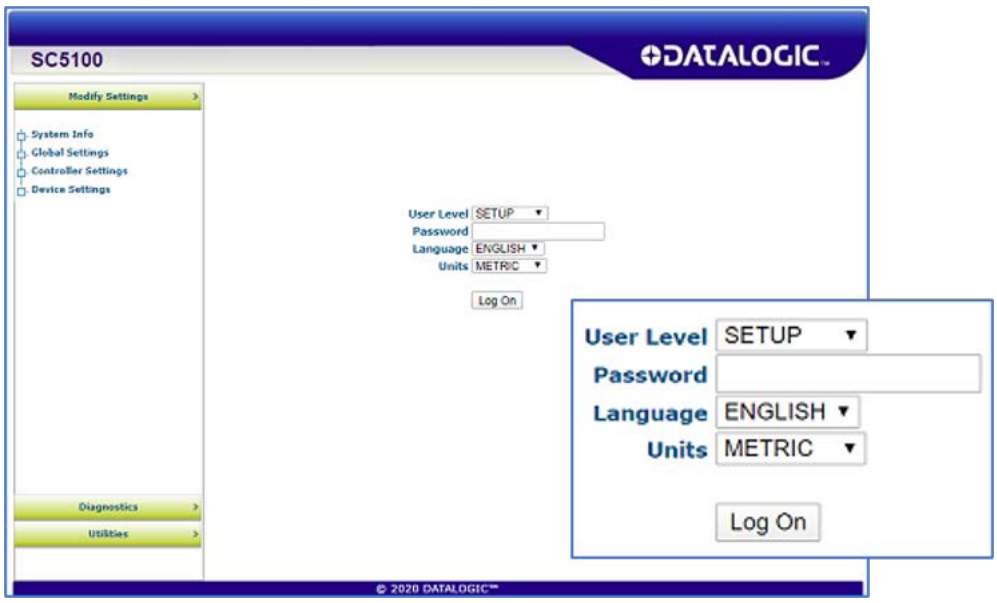
WARNING: DO NOT CONNECT THE BACKUP SC5100 AT THIS TIME!

DEFINE SYSTEM PARAMETERS

Start e-Genius

To access e-Genius:

1. Connect your computer to the Primary **SC5100 CFG (ETH 4)** port using either ETH CAB-GE10 M12-IP67 to RJ45 10M. If the CFG port is taken, the HOST port can be used.
2. Turn on your computer.
3. Open a web browser and enter the IP address for the Primary SC5100 Controller. If the correct IP address is entered, the **e-Genius** Log On window appears. The default setup IP address for all **SC5100 Controllers** is: 192.168.3.100 **(ETH4)** and 192.168.1.100 (Host).



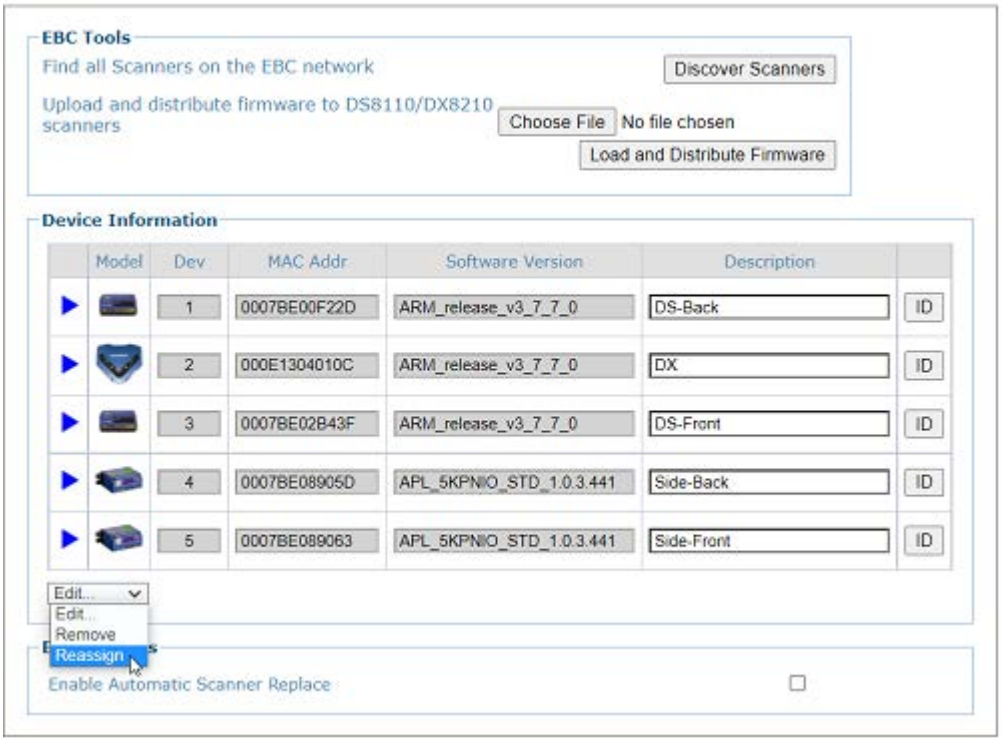
4. Click the **User Level** drop-down and select **SETUP**, enter a a valid Password. The default is DLA.
5. You will enter the SC5100 e-Genius System Overview/Information window.

Organize Device Positions

You want to make sure you have the Device positions and descriptions in your EBC and SyncNet Tools windows setup as necessary for your system.

1. In e-Genius select **Modify Settings > EBC Devices or Modify Settings > SyncNet Devices**

2. Select **Reassign** from the **Edit** drop-down options.



3. When you select **Reassign**, drop-down options appear for each device within the network.

4. Select a correct device number for the specified device.

5. Once you have properly assigned all positions and entered all descriptions, click **OK** by the Reassign option to save your re-assignments.

Define Remaining Parameters

Use e-Genius to define all of the parameters for the SC5100 Primary Controller as well as the Devices connected to the controllers. See the product specific Reference Guides for each product for parameter details.

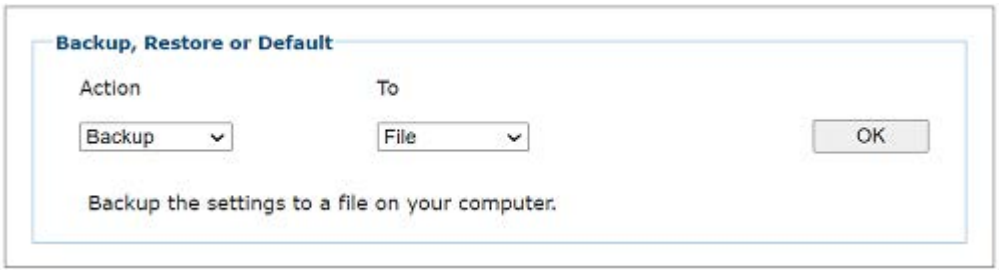
Perform PackTrack Calibration

Perform PackTrack Calibration for each device within your system. See the product specific reference guide for how to complete this process.

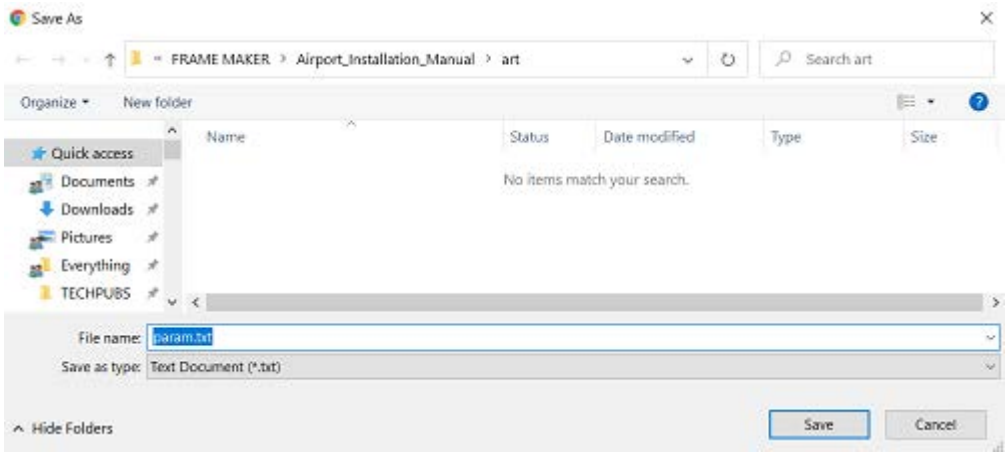
Save Parameter File of Primary SC5100

Once you have completed configuration of your system for the single (primary) controller, you must create a backup of the parameters.

1. In e-Genius select **Utilities > Backup or Restore.**



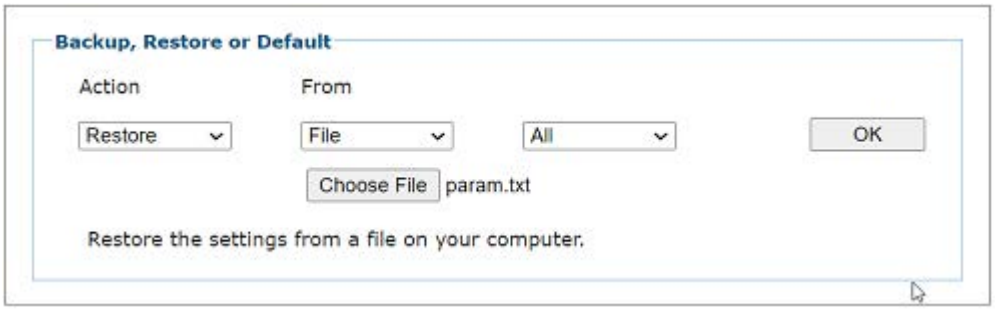
2. Select **Backup** from the Action drop-down and **File** from the To drop-down. Click **OK** and a text backup file of the parameters is available.



3. Click **Save** to save the text file to your desired location.

Load Parameter File to Backup SC5100

1. Disconnect the **Primary SC5100** from your laptop.
2. Connect the **Eth 4** port of the **Backup SC5100** to your laptop.
3. Enter e-Genius of the Backup SC5100.
4. In e-Genius select **Utilities > Backup or Restore.**



5. Select **Restore** from the **Action** drop-down and **File** from the **From** drop-down. Choose the parameter file you saved.
6. Make sure to choose **All** from the Application drop-down.
7. Click **OK** to save these parameter settings to your **Backup SC5100.**

Enter REDS Settings on SC5100 Keypads

On the keypad of each SC5100 you must specify which is the **Primary** controller and which is the **Backup** controller.

1. Press **DOWN** to scroll down through the menu options until you get to **Utilities**. The menu selection you are on appears in blue.
2. Press **ENTER** to access the Utilities option's.
3. Press **DOWN** to scroll down through the Utilities options until you get to **REDS Cfg**.
4. Press **UP** to scroll up through the options and **DOWN** to scroll down through the **REDS Cfg** options until you get to **Primary** on the Primary Controller and **Backup** on the Backup Controller.



5. Press **Enter** when done.
6. Press **Clear** to exit the **Utilities** menu.

Power Off System

Power off the entire system.

Connect ALL Devices

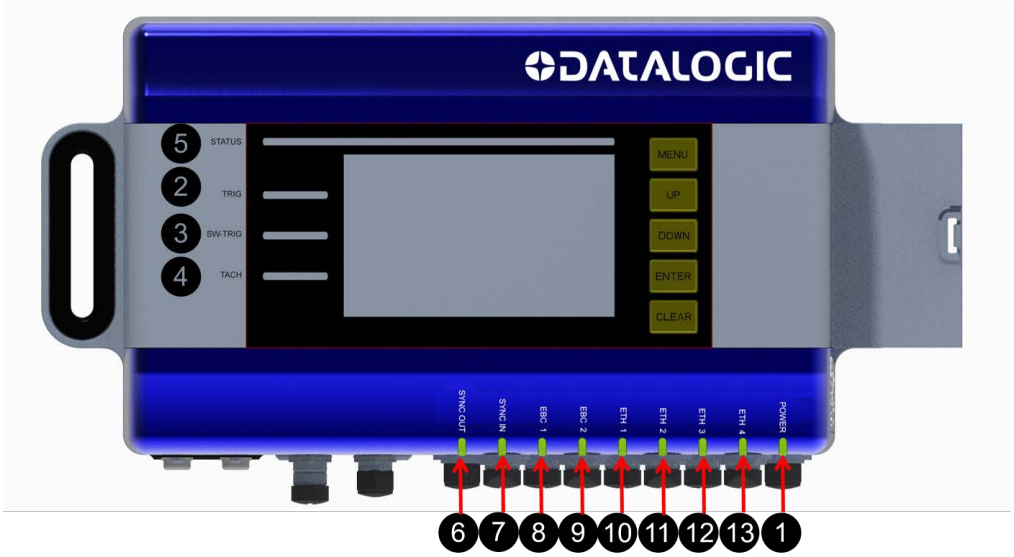
Now connect the Backup SC5100 to the EBC network and make all other system connections.

Power-up System

Power Up the system.

CHECK STATUS OF PRIMARY AND BACKUP SC5100

The LEDs on the SC5100 should operate as listed below when the system is operating as it should.



SC5100 LEDs

STATUS=	Light Green
TRIG =	Light Green (when Photocells are triggered)
SW TRIG=	Light Green (when Photocells are triggered)
TACH=	Light Green (when Conveyor Belt is moving)

The Default (Dashboard) display of each SC5100 shows which device it is and the status.



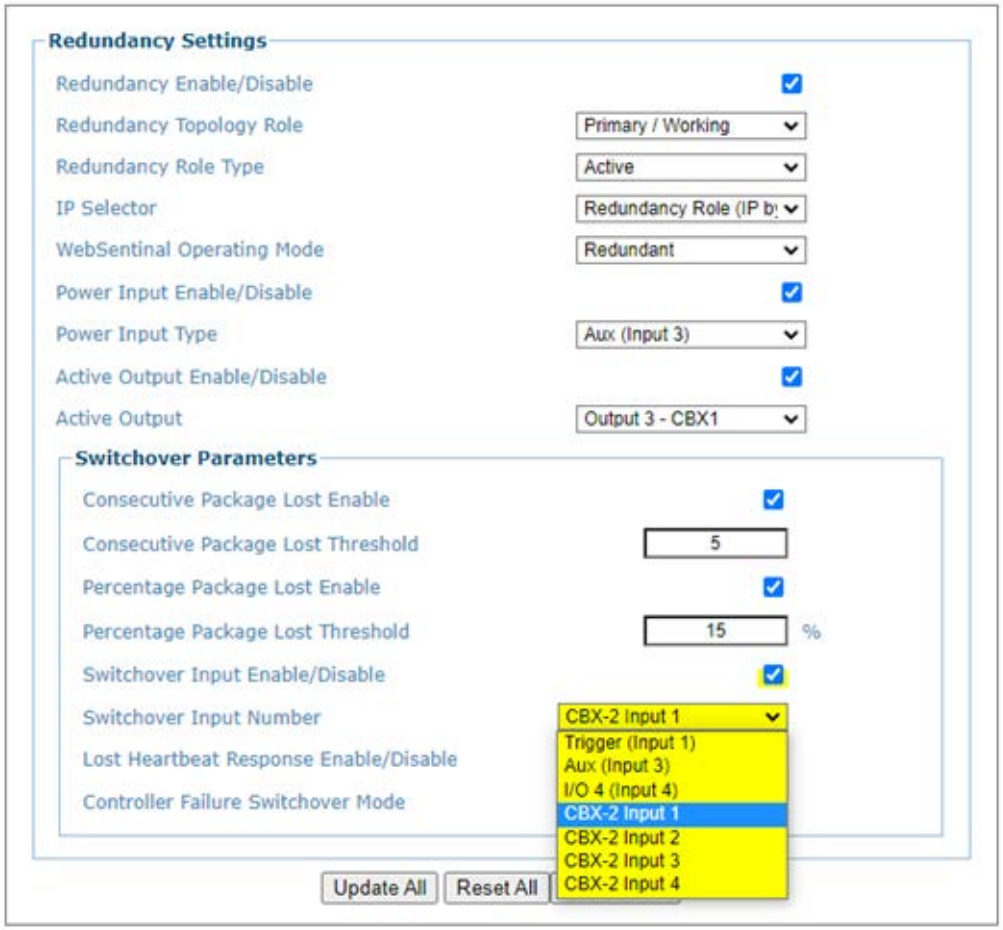
SETTING UP REDUNDANT OPERATION

After completing the preceding steps, you must now make sure Redundancy settings are correct for each SC5100. Again your Eth 4 port of each SC5100 must be connected to your computer and you must enter e-Genius.

NOTE: The Operating Mode must be set to PackTrack for this option to be available.

To view and edit the Redundant Operation Settings:

1. In the menu under Modify Settings, navigate to **Controller Settings | Redundant Operation**. The **Redundant Operation** window opens.



WARNING: In a redundant (REDS) system with Start Input From Bus selected in Operating Mode (see Operating Mode in Online Help), the PLC must trigger both SC5100s. Both SC5100s need to receive the same trigger so the redundant controller is able to compare packages with the packages of the active controller. This is true for all fieldbus.

WARNING: The Ethernet/IP addresses of the redundant SC5100s will switch if the "Primary" SC5100 fails and the "Backup" SC5100 takes over, allowing the PLC to find a consistent IP address.

For other fieldbus, the IP address will not switch, so the PLC has to be connected to both IP Addresses and check for data on both controllers.

2. Enter the appropriate information in the form as described below:

Redundancy Enable/Disable

Select the Enable check-box to enable redundancy options.

Redundancy Topology Role

Select Master Working, or Master Protecting from the drop-down list.

- **Master Alone**
- **Master Working:** SC5100 is configured as Master Working within the Redundancy system.
- **Master Protecting:** SC5100 is configured as Master Protecting within the Redundancy system.

Redundancy Role Type

Select Active, or Standby from the drop-down list.

WebSentinal Operating Mode

Select Redundant from the drop-down list.

Redundant: this mode is available only when working in a redundant system; WebSentinel reports information about the resource status of both the active controller and the stand-by controller.

Power Input Enable/Disable

Select the check-box to enable power input.

Power Input Type

Select Trigger (Input 1), Aux (Input 3), or I/O 4 (Input 4) from the drop down list.

Active Output Enable/Disable

Select the check-box to enable active output.

Active Output

Select Output 1, 2, 3, or 4 from the drop down list.

Switchover Parameters

Consecutive Package Lost Enable

Select the check-box to enable.

If checked, it enables a Consecutive Package Lost Threshold to cause the exchange of the Redundancy Role between the Active SC5100 and the Stand-by SC5100 of the system.

Consecutive Package Lost Threshold

Enter the number of consecutive packages recognized by the Stand-by SC5100 but not by the Active SC5100, (the active controller is losing packages), after which the Redundancy Role is exchanged.

Percentage Package Lost Enable

Select the check-box to enable.

If checked, it enables a Percentage Package Lost Threshold to cause the exchange of the Redundancy Role between the Active SC5100 and the Stand-by SC5100 of the system.

Percentage Package Lost Threshold

Enter the percentage (number out of 100 packages counted) recognized by the Stand-by SC5100 but not by the Active SC5100, (the active controller is losing a percentage of packages), after which the Redundancy Role is exchanged.

Switchover Input Enable/Disable

Click the check-box to enable a Switchover Input.

Switchover Input Number

Click the drop-down to select the input number from which the Switchover signal will come.

Lost Heartbeat Response Enable/Disable

The heartbeat monitor can be enabled to check for the host connection to 'echo' a response to each heartbeat message. If enabled, an error is generated if the specified number of messages is missed. This error can be used to trigger a REDS switchover or with the "paired Host Ethernet port" option.

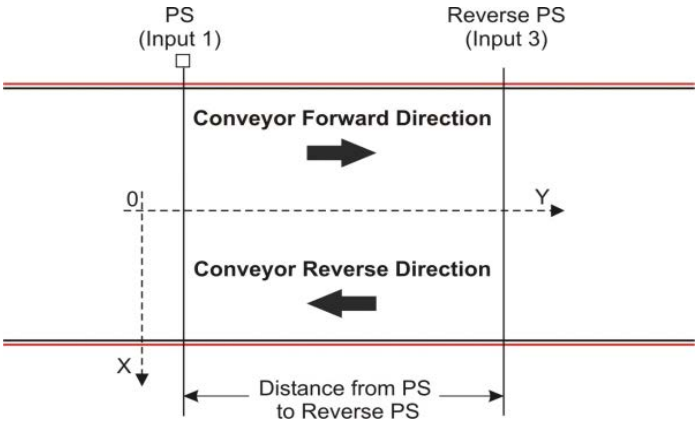
Controller Failure Switchover Mode

Select **Normal** or **Fast** from the drop-down.

3. When you have finished making changes, click **Update All** to save all pending changes, click **Reset All** to revert to all previously saved values, and click **Reset Page** to revert to previous saved values on the current page.

BIDIRECTIONAL SETUP

A Datalogic Bidirectional system is a system that accommodates an application where the customer can change the direction of the conveyor. To accommodate a Bidirectional system an additional photocell is required, as well as other special equipment and specific software settings.

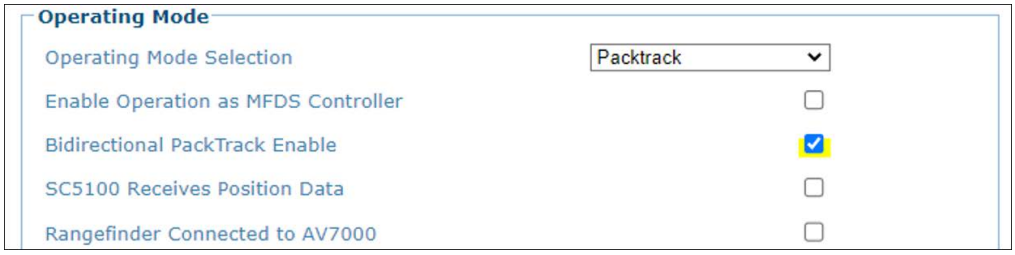


Use **Bidirectional Settings** to define how your system will recognize each direction.

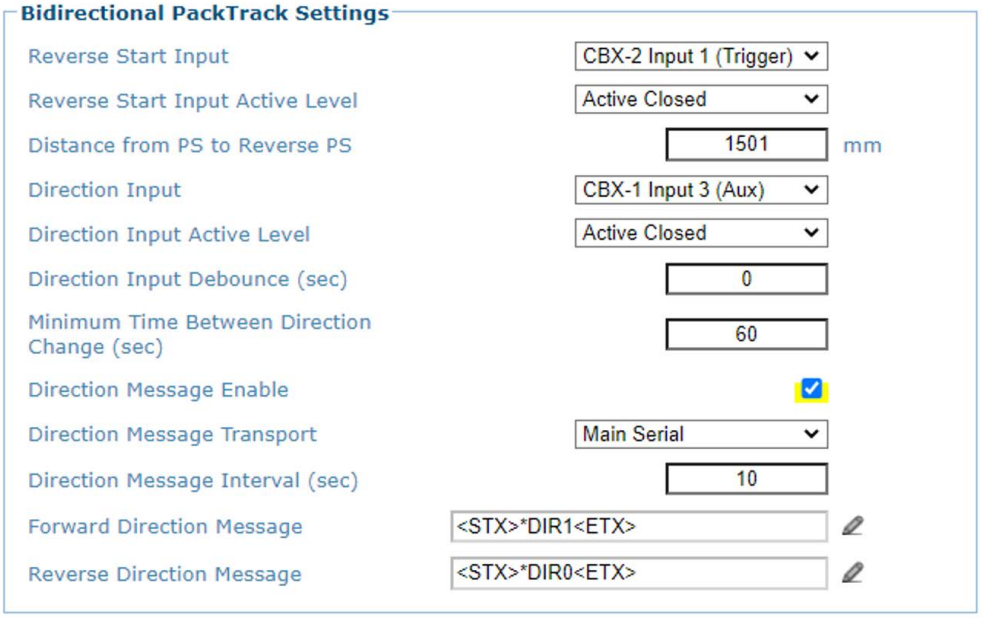
NOTE: The Operating Mode must be set to PackTrack for this option to be available.

To view and edit the Bidirectional Settings:

1. In the menu under **Modify Settings,** navigate to **Global Settings | Operating Mode.** The Operating Mode window opens.



2. Click the **Bidirectional PackTrack Enable** check-box. The following Bidirectional options become available.



Reverse Start Input

Select Trigger (Input 1), Aux (Input 3), or I/O 4 (Input 4) from the drop-down list. This defines the number of the input to be used as presence sensor when the conveyor has a reverse direction.

Reverse Start Input Active Level

Select Active Closed or Active Open from the drop-down list. This defines the logical level of the input indicating the reverse direction of the conveyor.

Distance from PS to Reverse PS

Enter a value to define the distance (mm [in]) between the PS (conveyor with forward direction) and the Reverse PS (conveyor with reverse direction).

Direction Input

Select Trigger (Input 1), Aux (Input 3), or I/O 4 (Input 4) from the drop-down list. This defines the number of the input transmitting information about the conveyor current direction.

Direction Input Active Level

Select Active Closed or Active Open from the drop-down list. This defines the active state of the Reverse Presence Sensor Input.

- Active Closed: The input is active when there is no current flowing through IN pins
- Active Open: The input is active when current flows through IN pins

Direction Input Debounce (sec)

Enter a value in seconds that specifies the debounce time of the direction input signal.

Minimum Time Between Direction Changes

Enter a value to specify the amount of time after a direction change, before another direction change is allowed.



NOTE: While the direction change is "locked out" the SC5100 display and Monitor page show the direction with {*} appended to it.

Direction Message Enable

Select the check-box to enable the sending of a direction message. If Direction Message is Enabled, the following options appear.

Direction Message Transport

Select from the drop-down on which port the Direction message will be sent.

Direction Message Interval

Enter a value in seconds that specifies how frequently the direction is sent.

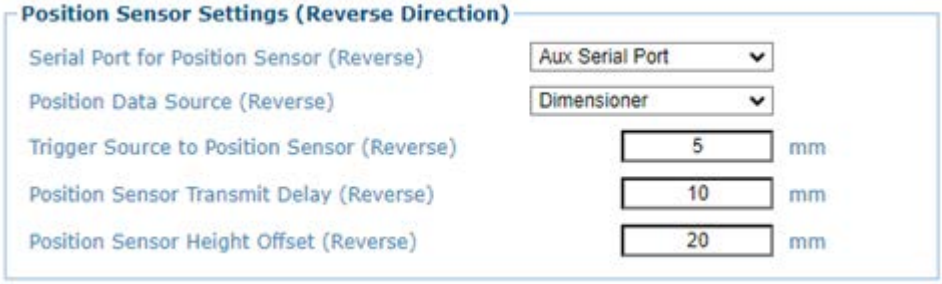
Forward Direction Message

Enter a text string using Enter Text Using the Text Entry Tool to be sent when the conveyor is going in the forward direction.

Reverse Direction Message

Enter a text string Enter Text Using the Text Entry Tool to be sent when the conveyor is going in the reverse direction.

Position Sensor Settings (Reverse Direction)



Serial Port for Position Sensor

Enter the width of the conveyor, which is needed to interpret the dimensioner data.

Position Data Source (Reverse)

Click the drop-down to select the data source for your position. Options are; Dimensioner, S85, Light Curtain.

NOTE: These S85 settings function the same as the AV Cameras and should be set to the same values.

Trigger Source to Position Sensor (Reverse)

Distance from the 'trigger source' (such as a photoeye) to the position sensor.

Position Sensor Transmit Delay (Reverse)

The amount of delay (if any) built into the position sensor. For a DC3000/DM3610 this is controller by a parameter in the dimensioner software.

Position Sensor Height Offset (Reverse)

An offset applied to the height.

Position Sensor Height Offset

An offset applied to the height.

NOTE: Trigger Source to Position Sensor and Position Sensor Transmit Delay should have the same values as the AV7000.

1. When you have finished making changes, click **Update All** to save all pending changes, click **Reset All** to revert to all previously saved values, and click **Reset Page** to revert to previous saved values on the current page.

CHAPTER 6
MAINTENANCE

BACKUP AND AUTOMATIC REPLACEMENT PROCEDURE

Once the system configuration has been completed using **e-Genius**. perform backup by one of the following methods:

WARNING: Before removing the SD card, disconnect power from the SC5100 Controller.

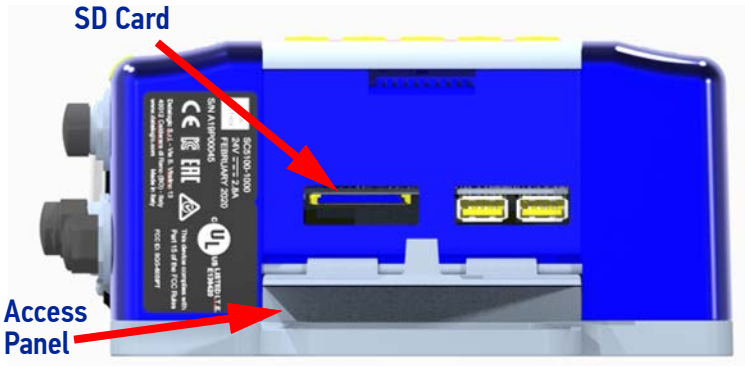
Backing Up the System Using e-Genius

You can also back up the system through **e-Genius.** See section **Backup or Restore.**

Replacing an SC5100

The SC5100 stores the system configuration and software on the externally accessible SD card. When replacing an SC5100 this card can just be moved to the new unit. In case of SC5100 failure, proceed as follows:

1. Disconnect power from the device.
2. Use a screw driver to remove the access panel to the SD Card and USB connectors.



3. Remove the SD Card.
4. Connect the new SC5100 to the system.
5. Insert the SD Card.
6. Close and secure the access panel of the replacement SC5100.



Make sure not to insert the SD card upside down. Carefully insert it in the guides, so that it will not fall inside the device. Gently push it into the slot.

7. Power up the system.

The system configuration is automatically restored and the reading station is ready to start working again.

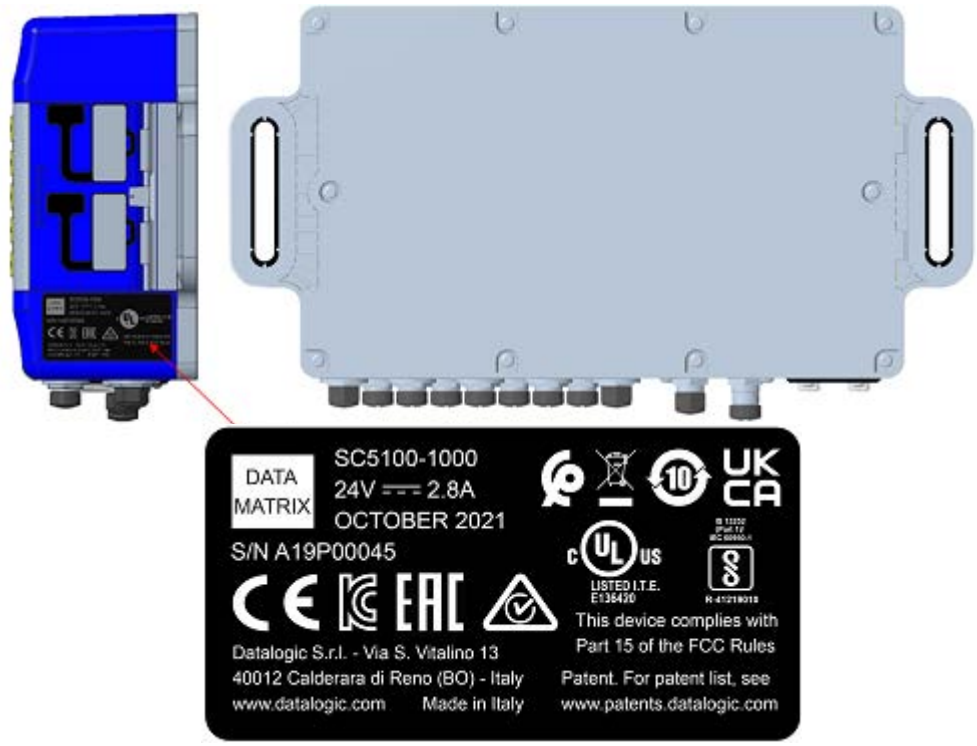
CHAPTER 7
TROUBLESHOOTING

NOTE: Due to the complex and application-specific nature of these installations, operational deficiencies of the system must be diagnosed and serviced by a trained and authorized Datalogic technician.

There are no user serviceable components or field replaceable parts (FRUs) inside the controller.

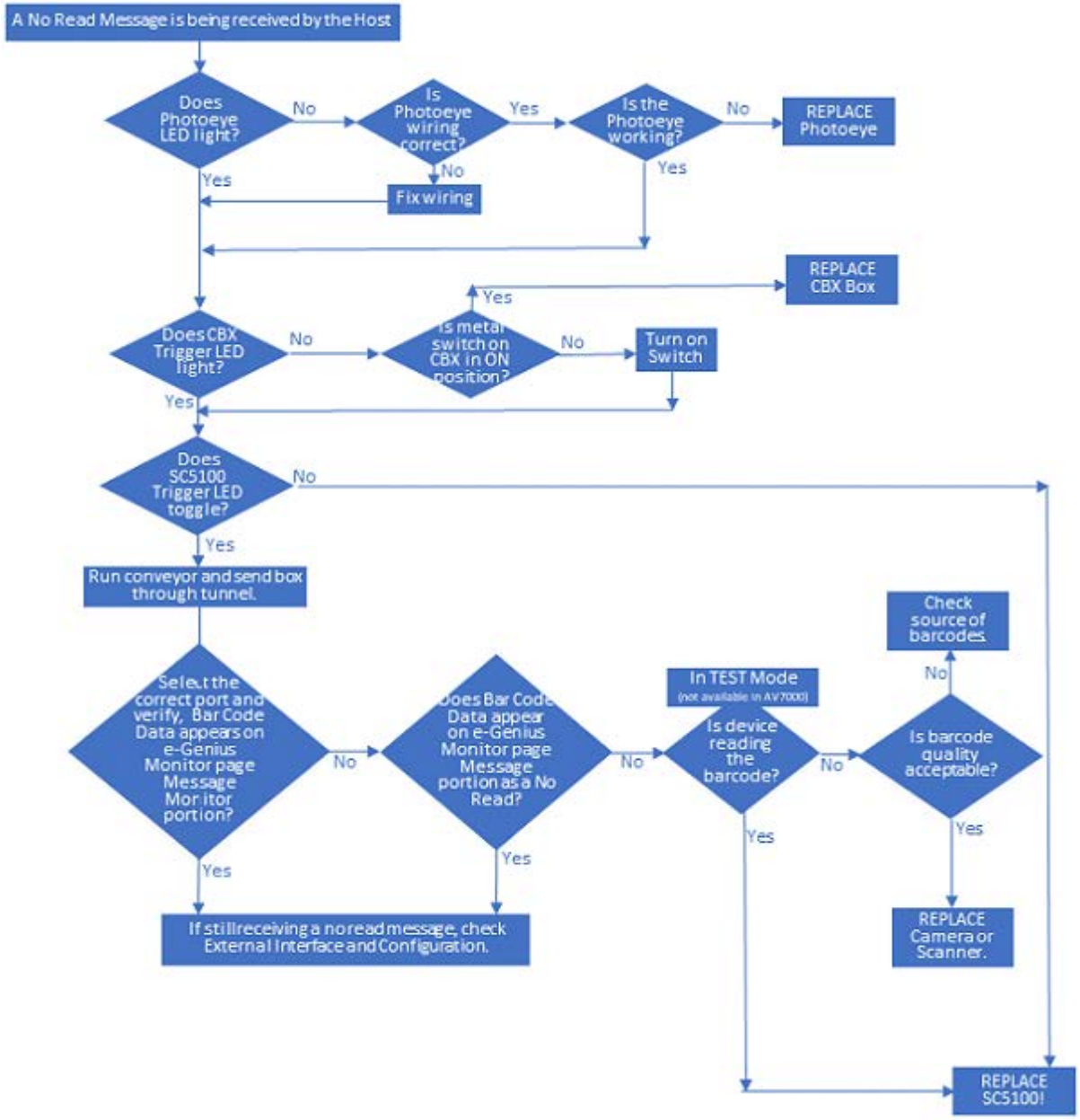
For further information on training, contact us through the Datalogic website at www.datalogic.com.

NOTE: When contacting Datalogic for help with any device, please be ready to share the unit serial number with the Datalogic technician. The unit's serial number tag is located on the device, where shown below. Help desk contact information is available at www.datalogic.com.

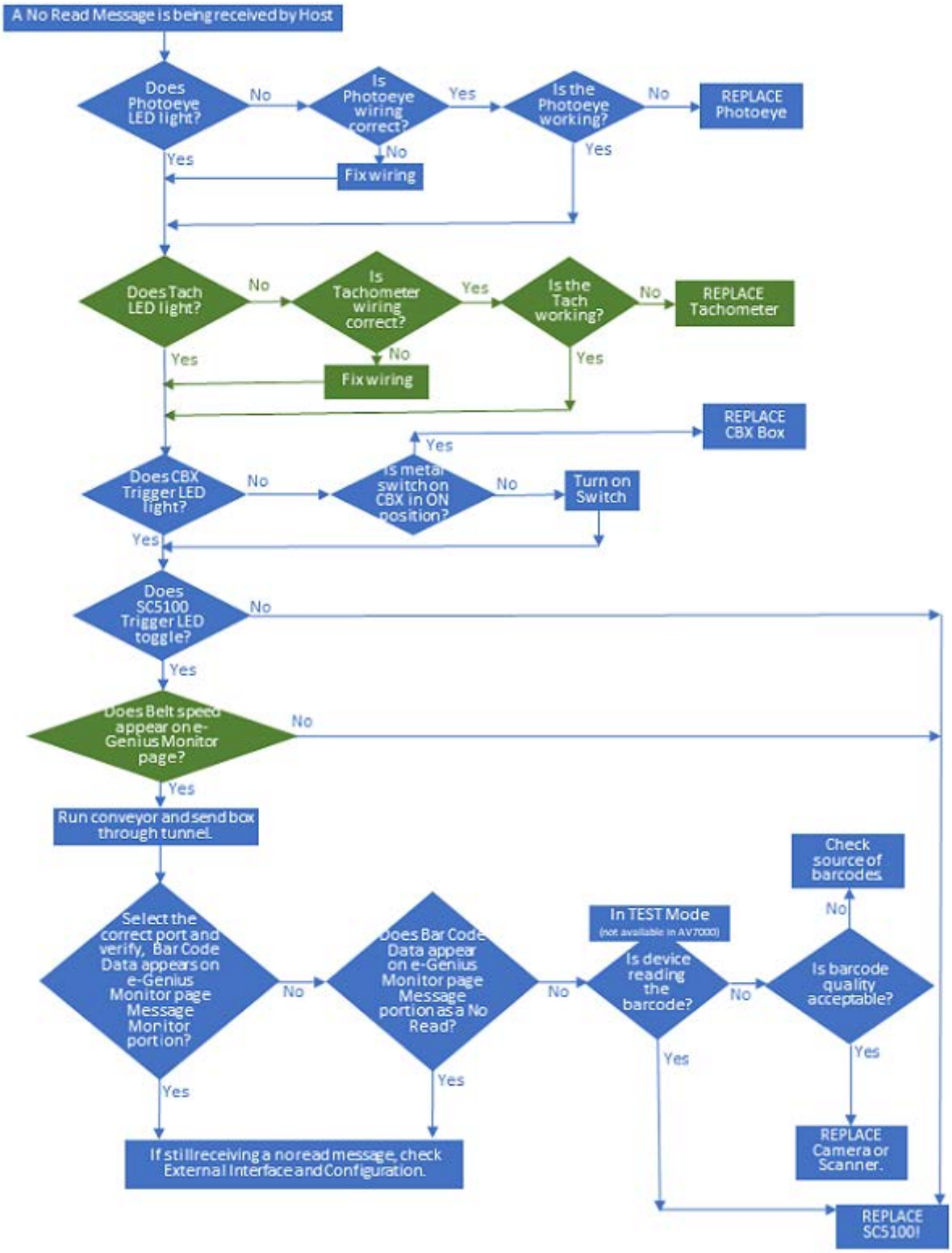


TROUBLESHOOTING GUIDES

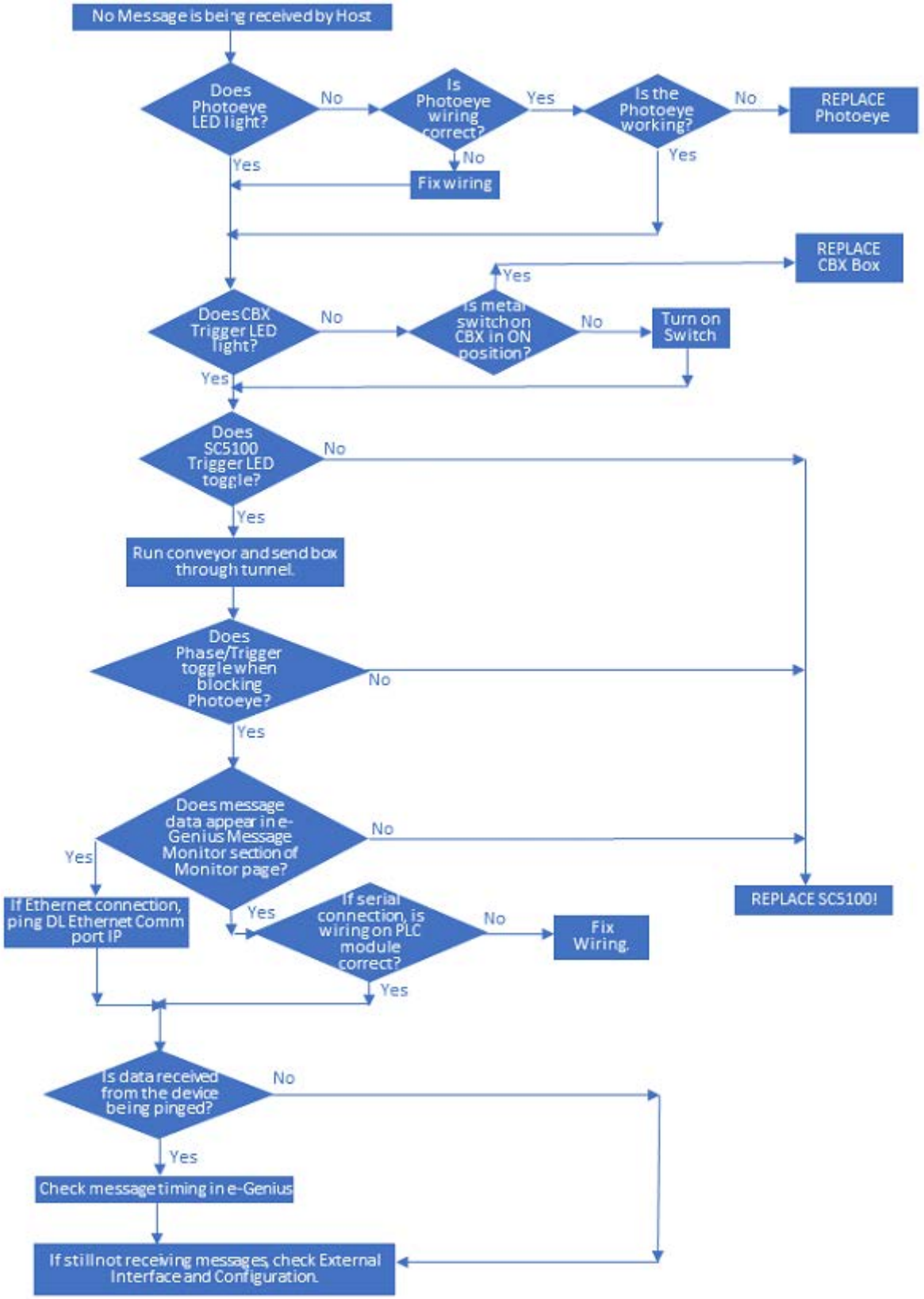
Online Mode - NO READ



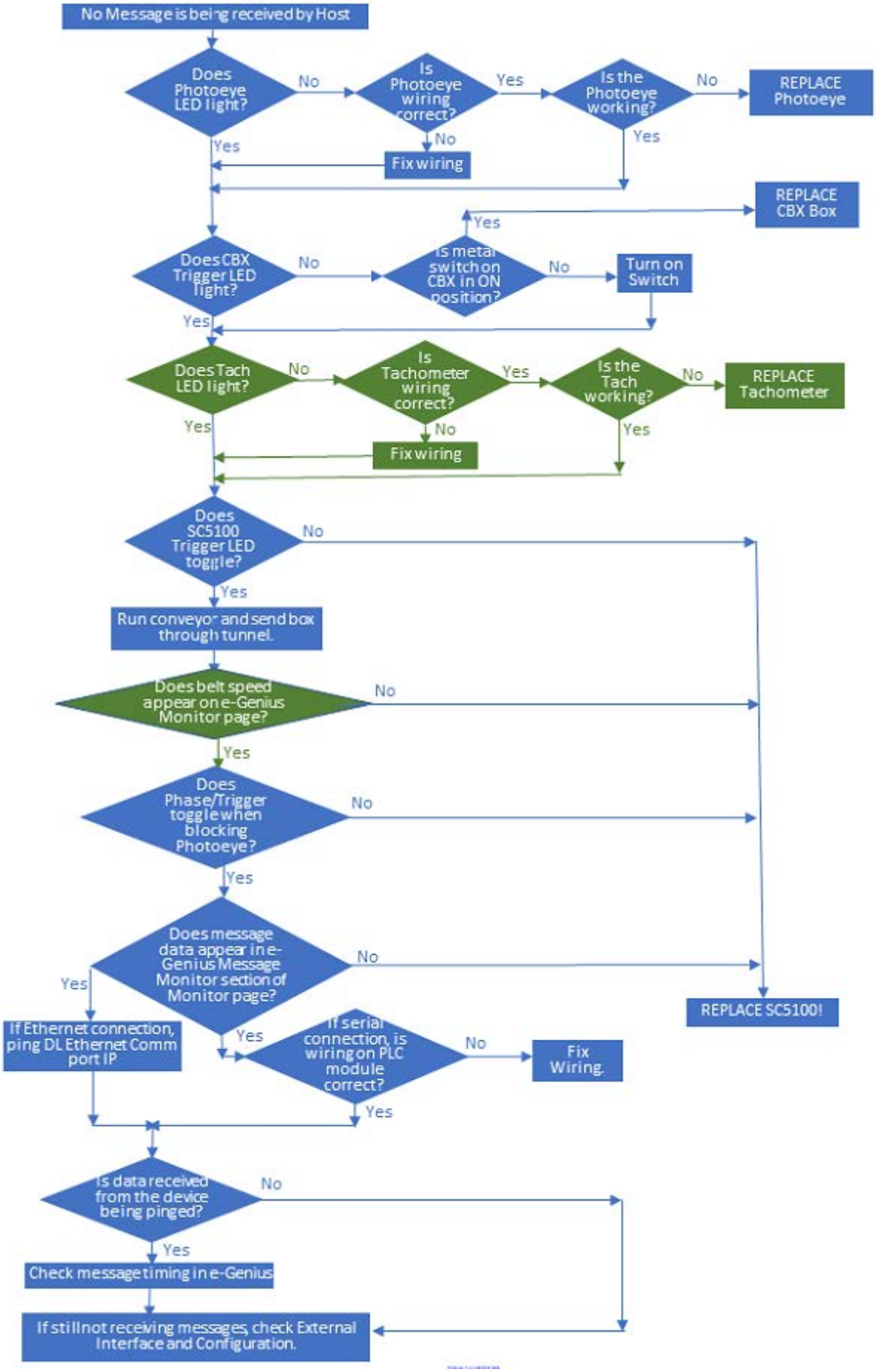
PackTrack Mode - NO READ



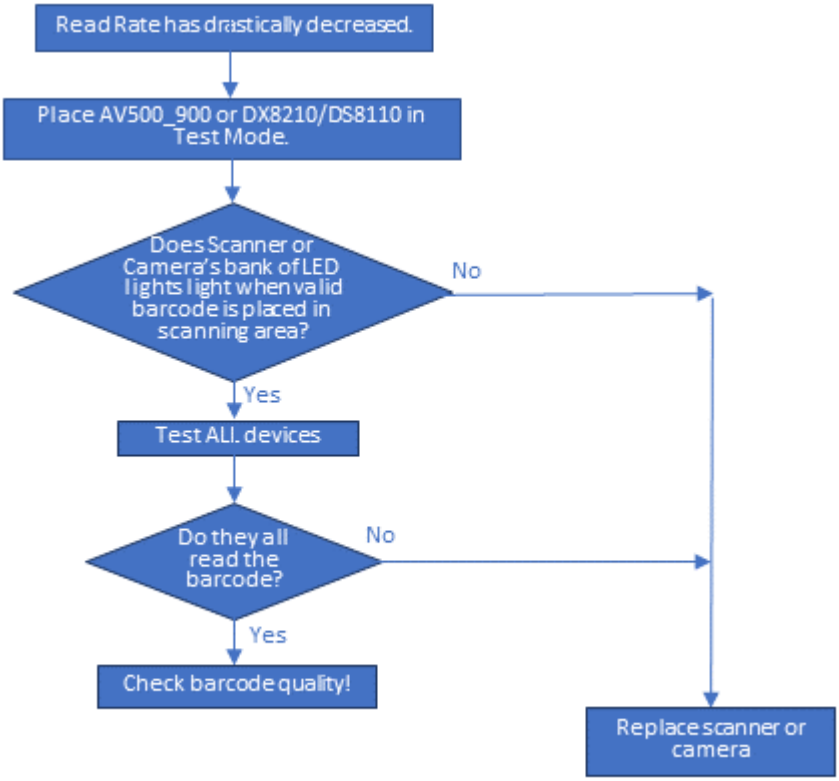
Online Mode - NO READ MESSAGE



PackTrack Mode - NO READ MESSAGE



Low Read Rate



ERROR CODES AND RESOLUTIONS

Error Code	Description	Severity	Explanation	Symptom	Troubleshooting	Action required
1	Node not responding	Error	In a Master/ Slave configuration, the Master monitors the status of the Slaves in its network. If a slave unit fails to be identified, the Master will post this message.	The scanning tunnel's no-read rate increases. More than one slave unit may be shown as not responding.	In a tunnel configuration, the cabling that connects the system into to a network must be intact or a scanner will be reported as not responding. Make sure all the slave units are powered on.	Make sure cables are connected. Check scanners power source. Replace scanner.
80	Node Reset	Error	In a Master / Slave configuration, the Master monitors the status of the Slaves in its network. If a Slave resets, it sends a reset message to the Master. The Master then posts this error condition on the diagnostic screen.	The scanning tunnel's no-read rate may increase during the Slave scanner's reconnection.	This condition is related to a slave scanner. Make sure the power source of the slave is not faulty.	If condition persists, replace the scanner.
81	Motor Failure	Error	The scanner's mirror wheel motor has failed.	The scanner will be powered up but will not emit laser light from its exit win- dow. The scanners motor will not be spinning.	- Hold your hand in front of the scanner to determine if the laser is on.	This is an internal failure and is not field serviceable Replace scanner.

83	Laser Failure	Error	Scanner has a laser failure.	There is no laser light emitted from the scanner The mirror wheel motormay still be spinning, however, the motor speedmay be out of range at which time the scanner will turn off the laser light.	- Hold your hand in front of the scanner to determine if the laser is on.	This is an internal failure and is not field serviceable. Replace Scanner.
130	Encoder Timeout	Warning	No encoder (tachometer) is detected in specified time. The Encoder signal provides the scanner with belt speed and other tracking information. This error will only occur when the scanner is in the PackTrack mode.	The scanner may experience an increase in noreads. The scanner may start miss- ing the transmit point.	Confirm that the belt is running. Make sure the encoder (tachometer) wheel is making a firm contact with the conveyor. Check the **Global Settings | Diagnostics | Encoder Timeout** setting to confirm that it is not set too low (See “Diagnostics” on page 160).	Adjust the encoder (tachometer) mounting. Adjust the **Encoder Timeout** setting (See “Diagnostics” on page 160).
131	Input 1 Failure	Error	The Primary PS (photoelectric sensor) Input is stuck in the active state (PackTrack Mode).	The scanner will not go into trigger. No data will be transmitted to the Host.	Check the alignment of the photoelectric sensor. Check the functionality of the photoelectric sensor.	Realign the photoelectric sensor. Replace the photoelectric sensor.
132	No Phase Error	Error	No Phase "timeout" is exceeded (On-Line and PackTrack Mode). Trigger must be identified within a speci- fied time.			

133	Input 2 Failure	Error	Secondary PS (photoelectric sensor) Input Failure Stuck Active (Pack-Track Mode).	The scanner will not go into trigger. No data will be transmitted to the Host.	Check the alignment of the photoelectric sensor. Check the functionality of the photoelectric sensor.	Realign the photoelectric sensor. Replace the photoelectric sensor.
135	Encoder Failure	Error	Phase input (trigger source) is activated while encoder (tachometer) is stopped (Pack- Track Mode).	No data will be transmitted to the host. Scanner(s) will not read any barcodes. System receives trigger cycle when no encoder signal is present.	Check **Diagnostics | Monitor** to see if the scanner is reporting a conveyor speed (See "Diagnostics | Monitor" on page 184). Make sure the encoder (tachometer) wheel is making a firm contact with the conveyor.	Adjust, realign, or replace the encoder (tachometer).
136	Redundancy Role Exchange Warning	Warning	This warning is generated on the Stand-by SC5100 to sig nal that the exchange of the Redundancy Role is in progress.			
138	Redundancy Warning	Error	Redundancy is not available.	The Master Stand-by SC5100 does not work OR an encoder or presence sensor error is gener ated on the Master Stand-by SC5100.		
139	EBC Communication Failure	Error	Communication through the EBC interface has failed.			
141	Master Failure	Error	Communication to the Master (Active or Stand-by) is not available.			

143	Power Failure	Error	A power drop has occurred in the PWR power supply.			
145	Presence Sensor Failure	Error	A presence sensor warning has occurred only on the Stand-by SC5100 of the redundant system and is transmitted by the Active SC5100.			
147	Encoder Failure	Error	An encoder warning has occurred only on the Stand-by SC5100 of the redundant system and is transmitted by the Active SC5100.			
163	Max Consecutive Lost Parcels	Error	The Standby SC5100 has recognized that the Active SC5100 has exceeded the defined number of maximum consecutive lost parcels. This will cause a Redundancy Role exchange.	Redundancy Role exchange		
165	Max % of Lost Parcels.	Error	The Standby SC5100 has recognized that the Active SC5100 has exceeded the defined maximum percentage of lost parcels (out of 100 parcels). This will cause a Redundancy Role exchange	Redundancy Role exchange		

169	Main Serial Port Error	Error	Protocol Index message not received on Main Serial Port.			
176	Aux Serial Port Error	Error	ProtocolIndex message not received on Aux Serial Port.			
178	Ethernet Socket 1 Error	Error	Protocol Index message not received on User Socket 1.			
179	Ethernet Socket 2 Error	Error	Protocol Index message not received on User Socket 2.			
180	Ethernet Socket 3 Error	Error	Protocol Index message not received on User Socket 3.			
181	Ethernet Socket 4 Error	Error	Protocol Index message not received on User Socket 4.			
182	Ethernet Socket 5 Error	Error	Protocol Index message not received on User Socket 5.			
183	Ethernet Socket 6 Error	Error	Protocol Index message not received on User Socket 6.			

191	Fieldbus Mismatch	Error	Fieldbus module type does not match specified model. Module selection incorrect compared to the actual module installed.			
193	Fieldbus Config Error	Error	Error configuring fieldbus module.	Unable to communicate to the module.	Confirm that the unit is not communicating to the host. Confirm that the fieldbus parameters are configured properly (see “Fieldbus” on page 122).	Replace fieldbus module.
195	Fieldbus DHCP Error	Error	Profinet module had a DHCP error.	Unable to acquire an IP address.	Confirm that the unit is not communicating to the host. Confirm that the fieldbus parameters are configured properly (see “Fieldbus” on page 122).	Replace fieldbus module.
205	APD Temperature Error	Error	APD Temperature sensor is not working. A fluctuation in the scanner's temperature can have an adverse effect on several internal functions of the scanner. The scanner monitors the temperature, and if it is erratic, this error is posted.	The scanner may experience an increase in no-reads. The scanner may start miss- ing the transmit point.	Cycle power on the scanner; Wait until the unit has time to cool down. Restart the scanner and moni- tor it to determine whether the error reoccurs.	This is an internal failure and is not field service- able. Replace scanner.

207	In Beam Sensor Error	Error	The scanner has an in-the-beam sensor, which provides timing for the decoding of barcodes. The scanner monitors this signal, and posts this error if the signal is sporadic or missing.	The scanner stops reading barcodes.	Put the scanner in the test mode to test its ability to read the barcode (see "Diagnostics | Read Test" on page 186).	This is an internal failure and is not field service- able. Replace scanner.
211	PTP Error	Error	Cannot synchronize the internal clock using the PTP (precision time protocol) protocol. This clock sync pulse is generated by the controller unit. It is used to sync the read data of all the scanners in the network with the master unit.	LEDs flashing.	Confirm that all the scanners are connected in the chain. Use the scanner test mode to confirm that the scanner can statically reading a barcode (see "Diagnostics | Read Test" on page 186). Position a barcode on a box so it faces the questionable scanner, and dynamically test the scanner.	Replace faulty scanner.
219	Fieldbus Comm Error	Error	Cannot communicate with the fieldbus module.	- The host loses communication with the scanner.	Confirm that the unit is not communicating with the Host. Confirm that the fieldbus parameters are configured properly (see "Fieldbus" on page 122).	- Replace fieldbus module.

220	Network Ring Open	Error	When the SC5100 is used, the scanner internal network is connected in a chain configuration. If the SC5100 detects that network chain is not complete, it will post this error.	The system experiences a higher no-read rate. One or more scanners may not appear on the Diagnostic Mask Window (see “Diagnostics | Monitor” on page 184).	Confirm that all the scanners are connected in the chain. Use the scanner test mode to confirm that the scanner can statically reading a barcode (see “Diagnostics | Read Test” on page 186). Position a barcode on a box so it faces the question- able scanner, and dynamically test the scanner.	Replace faulty scanner.

CHAPTER 8
TECHNICAL FEATURES

ELECTRICAL FEATURES	
Supply Voltage	24 VDC +/1 20%
Power Consumption	2.8 A Max.
Communication Interfaces Serial Main (isolated) - RS232 - RS422 full-duplex	 1200 to 115200 bits/s 1200 to 115200 bits/s
Serial Aux - RS232	 1200 to 115200 bits/s
Ethernet (x2) TCP/IP	4 Ports Gb/s ETH Switch; Embedded EtherNet/IP
EBC and SyncNet Internal Network	100 Mbit/s
Alibi Storage (only SC5100-102x models)	“Legal For Trade” Alibi Storage for Scale Weight Data
Fieldbus - Profibus (only SC5100-1100 model) - Profinet (only SC5100-1200 model) - All models	 PROFIBUS DP application protocol; up to 12 Mb/s PROFINET-IO application protocol; 100 Mb/s Embedded EtherNet/IP; 100 Mb/s
Inputs (main)	3 polarity insensitive optocoupled inputs (5-30 Vdc) : Trigger, Encoder/Tachometer, IN3,
Outputs (main)	3 optocoupled outputs
Inputs (aux)	3 polarity insensitive optocoupled inputs
Outputs (aux)	3 optocoupled outputs
Input/Output	2 configurable Input/Output (PNP or NPN polarity insensitive optocoupled input, or optocoupled output)
USER INTERFACE	
LCD Display	5 inch graphical color
Keypad	5 keys

LED Indicators	POWER TRIG SW-TRIG Tach Eth2 Eth4	STATUS EBC 1/2 SyncNet In/Out Eth1 Eth3
SOFTWARE FEATURES		
Configuration Modes	e-Genius	
Parameter Storage	Non-volatile extractable SD-card	
ENVIRONMENTAL FEATURES		
Operating Temperature	0° to +50 °C (+32° to +122 °F)	
Storage Temperature	-20° to +70 °C (-4° to +158 °F)	
Humidity	90% non condensing	
Vibration Resistance EN 60068-2-6	14 mm @ 2 to 10 Hz; 1.5 mm @ 13 to 55 Hz; 2 g @ 70-500 Hz; 2 hours on each axis	
Shock Resistance	30 g; 11 ms;	
EN 60068-2-27	3 shocks on each axis	
Protection Class EN 60529	IP65*	
PHYSICAL FEATURES		
Mechanical Dimensions	349 x175 x 89 mm (13.75 x 6.89 x 3.5 in)	
Weight	1.94 kg (4.3 lb)	

*When all the M12 connectors and reading devices are correctly connected (or closed with proper protection caps).

APPENDIX A: SCALE ALIBI STORAGE

SCALE ALIBI STORAGE INTRODUCTION

Data security is essential to being a reliable transport provider. Today's measuring solutions offer alibi storage, where data is stored in a tamper-proof database for 90 days, making it easy to prove that data is accurate.

The alibi memory stores parcel data for a predefined amount of time—typically 3 months. Data cannot be tampered with unless an electronic seal is broken. If this happens, it provides an audit trail, detailing all changes to system settings. Alibi storage allows weights and measures officers or auditors to verify whether the data produced by your data capture equipment matches the information on customer invoices.

With legal-for-trade alibi storage, you can prove to customers that the weight and dimensions used for invoicing have not been manipulated.

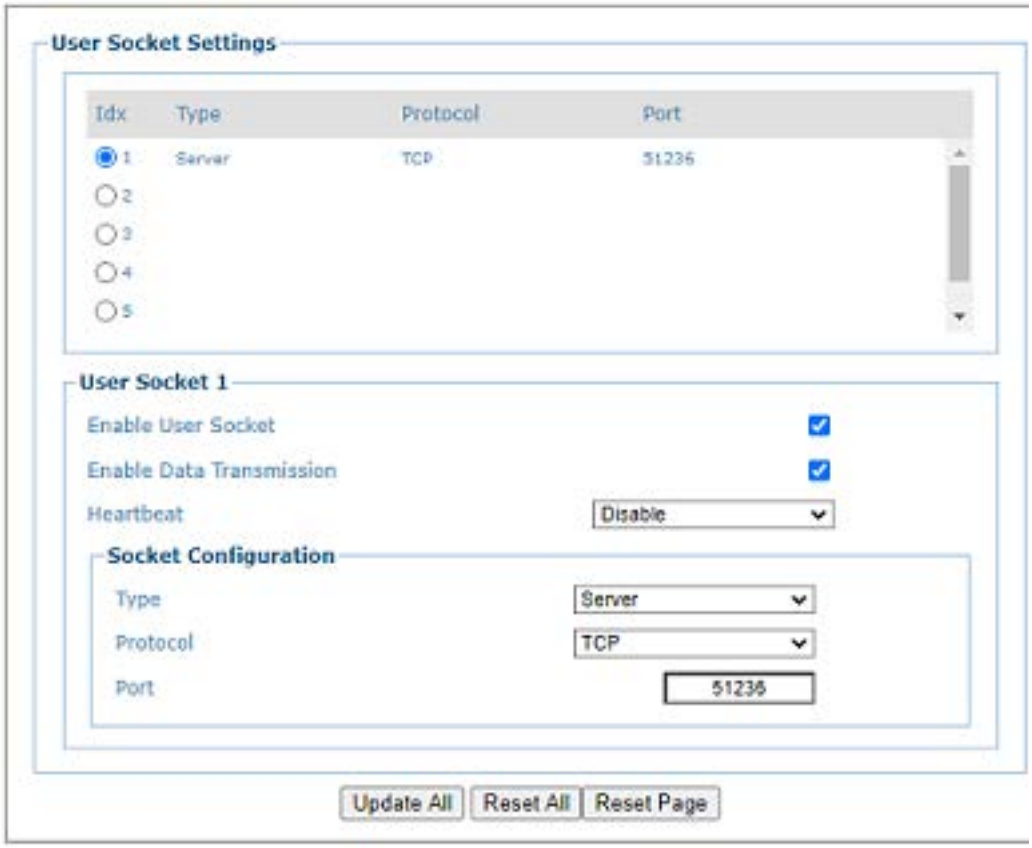
- **“Step 1” on page 97**
- **“Step 2” on page 98**
- **“Step 3” on page 99**
- **“Formatting Metter Toledo Scale Messages” on page 99**
- **“Formatting OCS Scale Messages” on page 100**

Step 1

Step 1 requires you to add a user socket to communicate with the Scale.

To view and edit User Sockets:

1. In the menu under **Modify Settings / Controller Settings / Ethernet**, select **User Sockets**. The **User Sockets** window opens.



2. Add a new **User Socket** that matches that of your **Scale** device. This allows the SC5100 to receive messages from the scale.

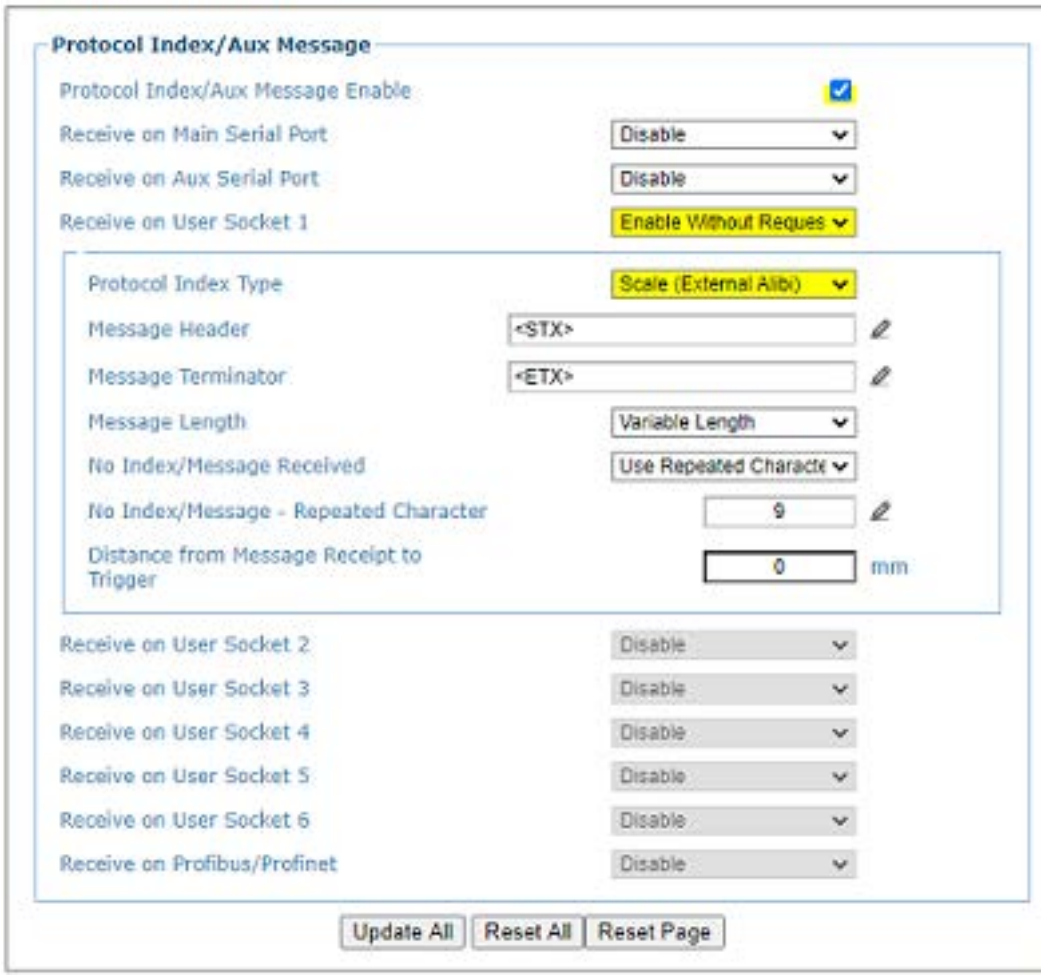
3. Select the **Type: Server** and **Protocol: TCP** and enter the **Port: 51236**.

Step 2

Step 2 requires you to define the communication with the scale. You do this by setting up a message using the Protocol Index

To Edit Protocol Index Settings:

1. In the menu under **Modify Settings / Controller Settings / Messaging**, select **Protocol Index**. The **Protocol Index** window opens.



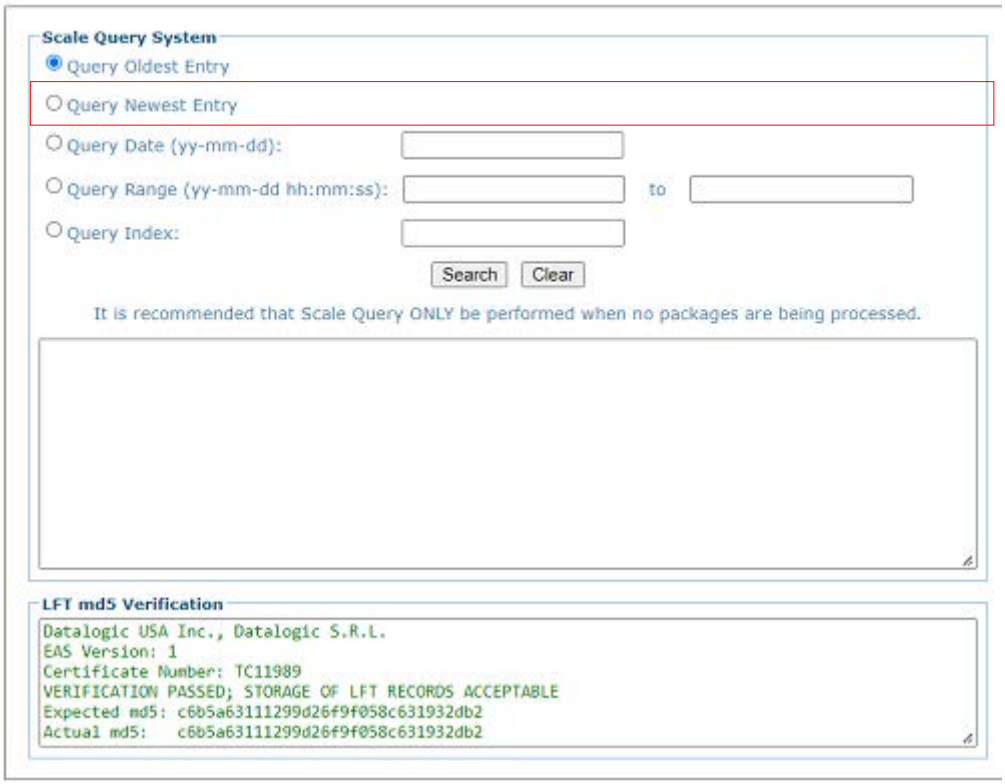
2. Click the check-box **Protocol Index/Aux Message Enable**.
3. Click the drop-down and change **Receive on User Socket N** option to "**Enable Without Request"**. The Socket number must be the same as the socket added in Step 1.
4. Click the drop-down to change the Protocol Index Type to Scale (External Alibi).
5. Enter the appropriate Message Header and Terminator. They must match the Scale Message of the scale you are communicating with.

Step 3

As a confirmation step, you can run a package on the conveyor and check the scale message is working as it should.

To View the Scale Message:

1. In the menu under **Diagnostics**, select **Scale Query**. The **Scale Query** window opens.
2. Click the radio button to select **Query Newest Entry** and click the **Search** button.



3. View the scale_transid or scale_timestr fields to verify the message.

FORMATTING METTER TOLEDO SCALE MESSAGES

Mettler Toledo scale messages are ascii, start with S and end with <cr><lf>. If anything other than a space follows the S, the weight is not legal-for-trade (LFT) and not to be stored in the alibi.

There are two types of MT scale, single and double

Single scale LFT messages are of the following format: S<al1sp><Weight><alisp><units><cr><lf>

Double scale LFT messages are of the following format: S<al1sp><Weight><alisp><units><al1sp><scale number><cr><lf>

- <al1sp> means a least one space.
- <units> should be g or kg (for grams or kilograms).
- <Weight> should be a number with a decimal point for kilograms and no decimal point for grams.
- <scale number> should be 1, 2 or 3

Units, weight and scale number can be pretty much any asci string that does not contain spaces.

FORMATTING OCS SCALE MESSAGES

This scale works from 0 to 60000g, but the LFT range is from 250g to 40000g.

This means that when we get weights out of LFT range, the value is without unit (g) and the Item Attribute is “F020” for underweight and “F010” for overweight.

The weight 100mm leading edge after 2° scale

Good weight:

<STX>2017-10-12;09:47:27; 2103470;01; 660;000002250;g ;0000;CD4F<CR><LF>

<STX>2017-10-12;10:39:27; 2103470;03; 669;000006050;g ;0000;70B9<CR><LF>

<STX>2017-10-12;10:39:57; 2103470;03; 670;000006050;g ;0000;A5B8<CR><LF>

Underweight:

<STX>2017-10-12;10:13:47; 2103470;01; 661;000000200; ;F020;4AB9<CR><LF>

<STX>2017-10-12;10:25:33; 2103470;02; 663;000000000; ;F020;80AE<CR><LF>

<STX>2017-10-12;10:27:50; 2103470;01; 664;000000050; ;F020;C5B4<CR><LF>

Overweight (for this case we have decreased the limit from 40000g to 7000g because is not easy to test over 40000g parcel):

<STX>2017-10-12;10:23:05; 2103470;03; 662;000006050; ;F010;26CE<CR><LF>

No weight:

<STX>2017-10-12;10:25:33; 2103470;02; 663;000000000; ;F020;80AE<CR><LF>

Heartbeat:

<STX>HH; auto;116; (E116) S1 Sensor 'I00' belegt oder defect<CR><LF>

Message sent:

<STX>2017-10-12;13:40:36; 2103470;03; 675;0****** ; ;F002;DAEF<CR><LF>

APPENDIX B: ETHERNET IP

The SC5100 supports the EtherNet/IP™ Industrial Networking protocol which we will refer to as EIP. EIP simplifies the communication of barcode and Input/Output data with other EIP enabled devices, such as a programmable logic controller (PLC).

Software release 1.3.0.0 and higher for the DS8110, DX8210, SC5100 product line supports the legacy ASI EtherNet/IP™ Object. This mode allows the installation of DS8110, DX8210 scanners and SC5000/5100 controllers in systems using PLC programs developed for Axiom, Axiom X, and AL5010 scanners and can also be useful if ControlLogix On-Demand Messaging is desired for an application (On-Demand Messaging is not available when the DLA Object is selected).

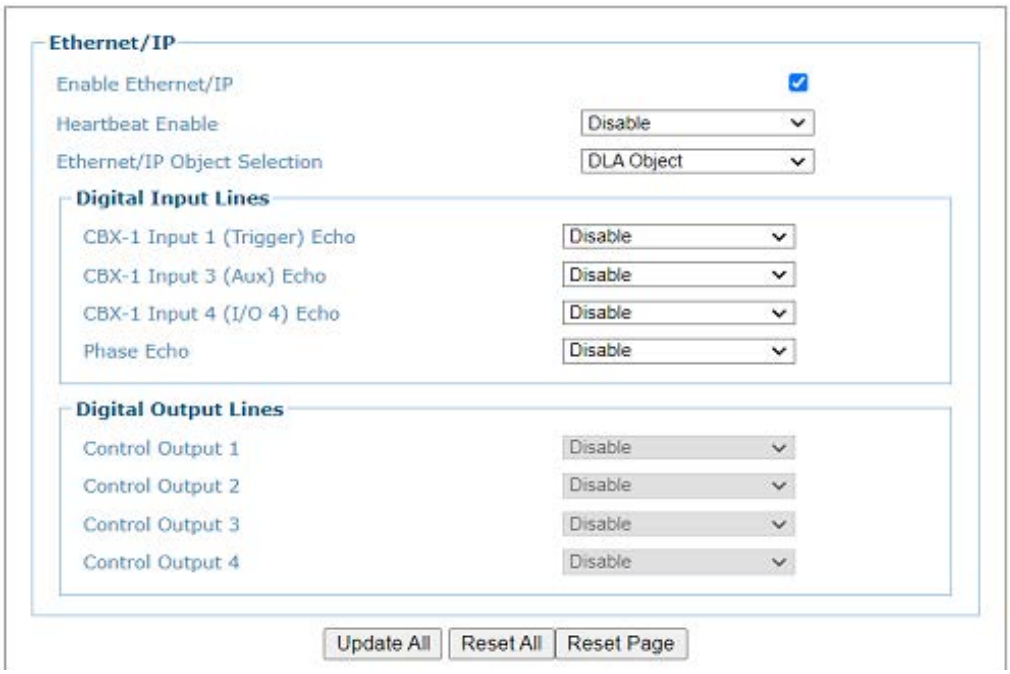
The ASI Object supports all configuration options available on the Axiom, Axiom X, and AL5010 with the exception of the 8 Reader Outputs.

ETHERNET/IP

EIP is not enabled by default in the reader.

To enable Ethernet IP follow these steps:

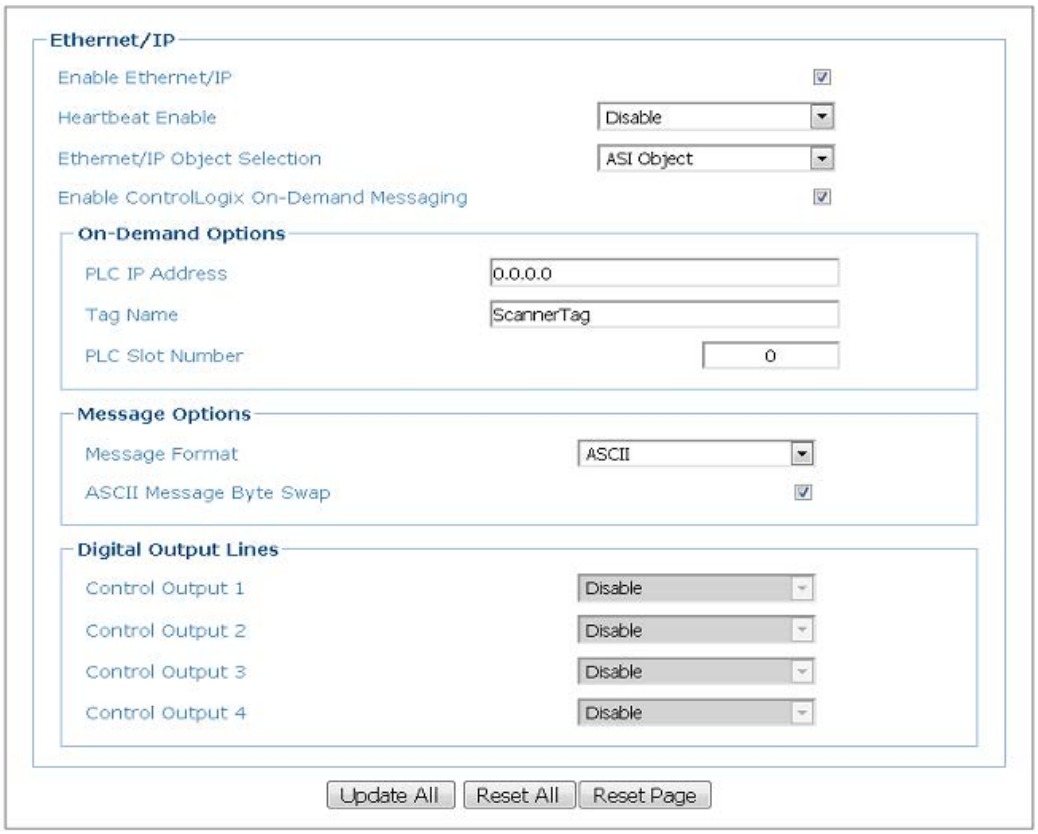
1. In the menu under **Modify Settings / Global Settings / Ethernet IP.** The Ethernet IP window opens.



2. Check the box to **Enable Ethernet/IP**.

3. From the Ethernet/IP Object Selection drop-down, select ASI Object. When Ethernet/IP is enabled, all of the other network capabilities of the reader remain active.

ASI Object: On Demand Options

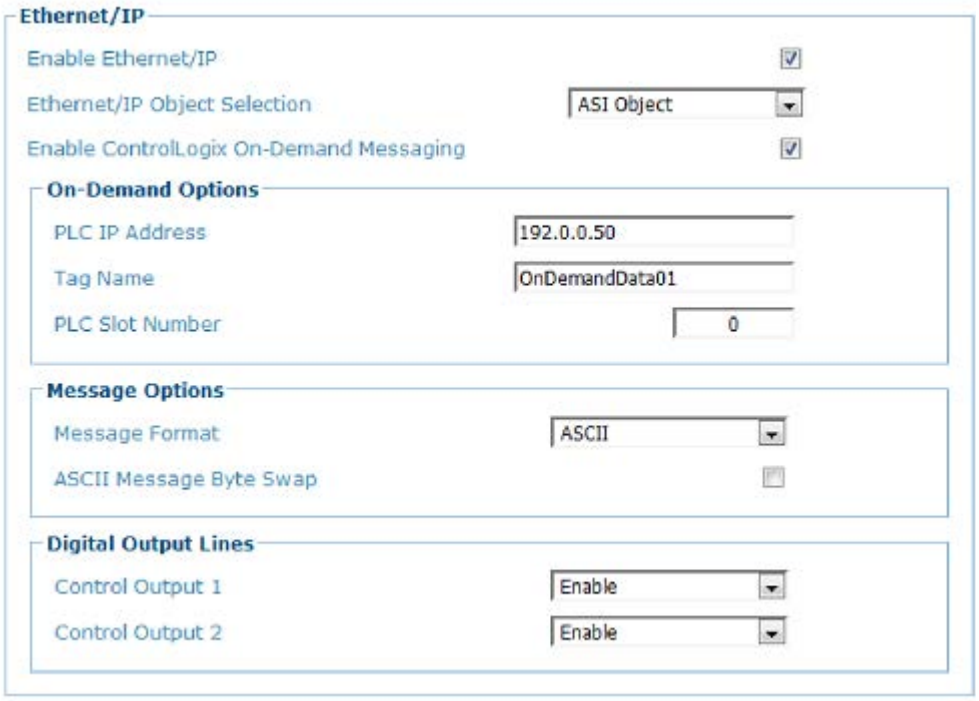


NOTE: Contact Datalogic Support for information on setting up ASI Objects (legacy Accu-Sort Devices).

Once enabled, EIP allows the reader to communicate with other Ethernet/IP enabled devices. This can be done using **Explicit Messaging, I/O Messaging** and a special protocol for ControlLogix Controllers called **On-Demand Messaging.** The EIP, ASI Object definitions follow.

I/O messaging can be used to monitor and set the readers I/O bits, and to obtain bar code data from the reader. The disadvantage is that the I/O messages are always sent at a scheduled interval creating a lot of network traffic.

By contrast, **On-Demand Messaging** (which only works with a ControlLogix Controller) allows bar code data to be sent to the Controller only when a bar code is read.

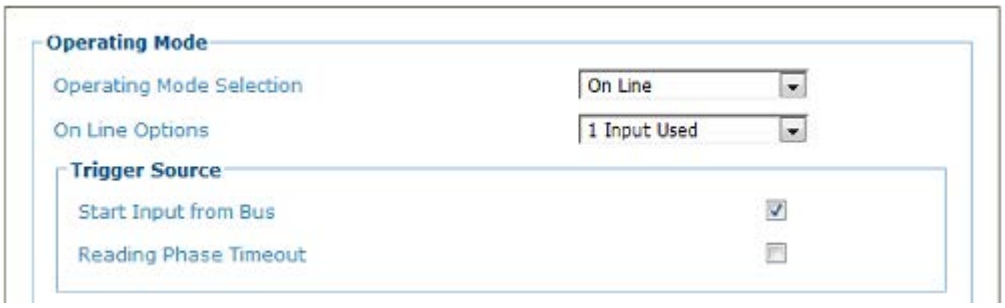


Select the check-box **Enable ControlLogix On-Demand Messaging**. This is described in more detail later in this document.

The **Message Format** parameters allow you to manipulate the format of the bar code data. Most notable if your barcodes only contain numeric digits, you can configure the reader to convert the bar codes to a numeric value instead of transmitting them as ASCII text.

The **Digital Output Lines** parameter can be used to relinquish control of the internal relays (2 relays for DS8110 and DX8210, and 4 relays for the SC5000/5100) to another EIP device. When this has been done, these relays are controlled by bits within the Output Word.

Lastly, When EIP is enabled, the option **Start Input From Bus** becomes available on the Operating Mode page of e-Genius.



When this is enabled, the reader trigger input is ignored and the reader will be triggered solely by manipulating the Trigger Bit in the Output Word (contained in the reader Assembly and Output Objects).

I/O ControlLogix Messaging Example

The following example illustrates how a reader can be configured to communicate with a ControlLogix processor using I/O messaging. Use this information along with the reader Object definitions for other EtherNet/IP devices.

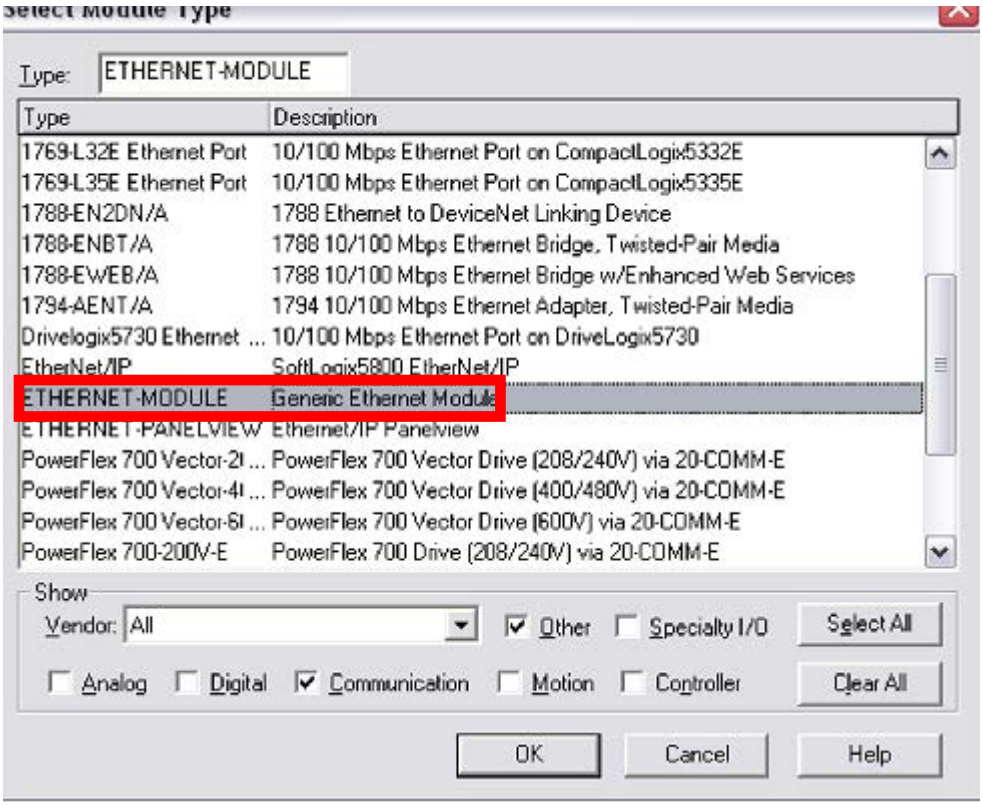
When EtherNet/IP is enabled on the reader, EIP I/O Messaging is automatically enabled. No further configuration on the Datalogic device is needed to setup I/O messaging.

Since the ControlLogix processor now treats the reader as an I/O device, to setup an EIP I/O message transfer between an reader and a ControlLogix processor, you need to configure your reader as a Generic Ethernet Module in the ControlLogix I/O tree.

Follow these steps to add a module:

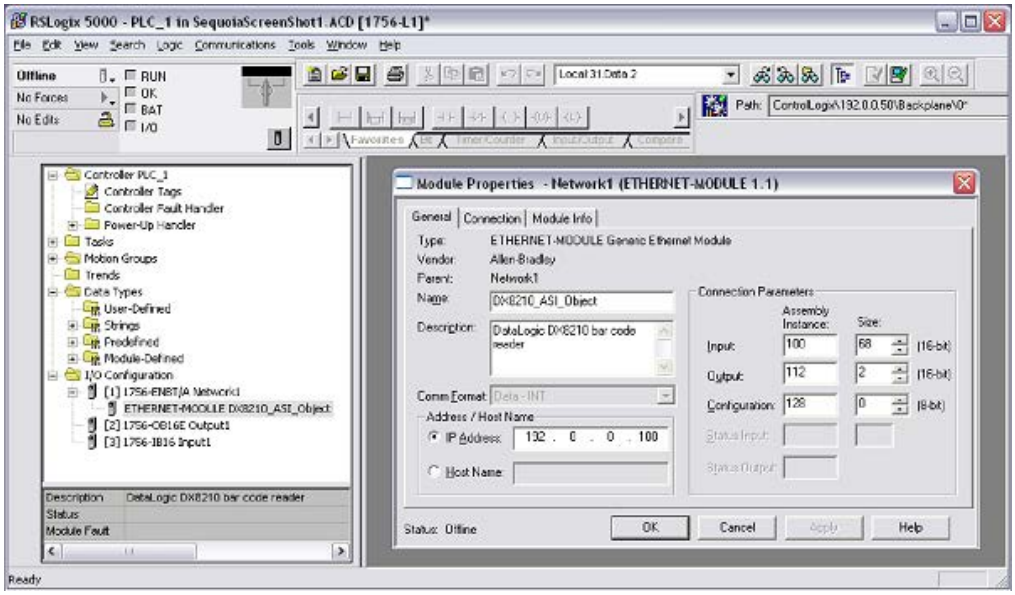
Right click and select **New Module** on the entry for your Ethernet module (such as 1756-ENET/A) under the I/O Configuration Tree. A list of options similar to what is shown below will appear.

1. From this list select **ETHERNET-MODULE** for the Generic Ethernet Module.



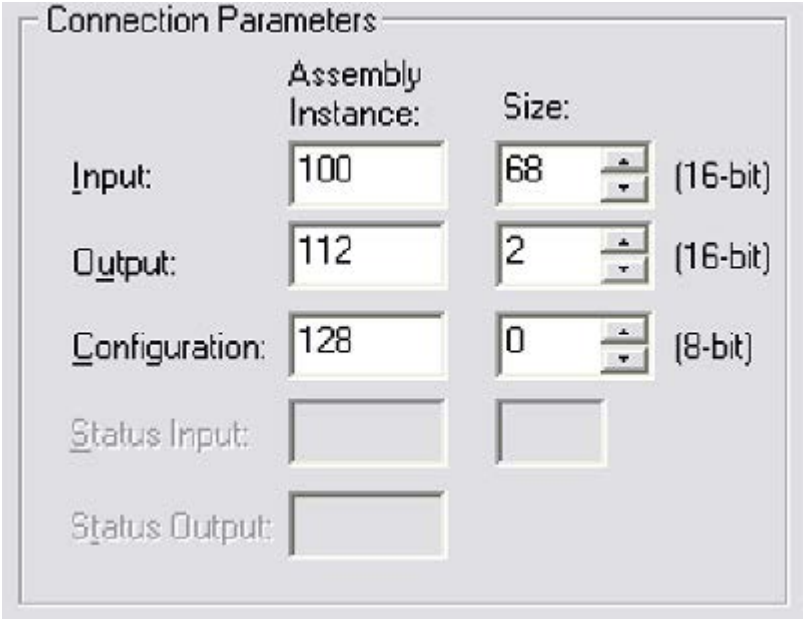
2. Click **OK.**

3. Specify the Properties for your reader. First set the Comm Format to Data-INT. **This must be done first as it cannot be changed later.**

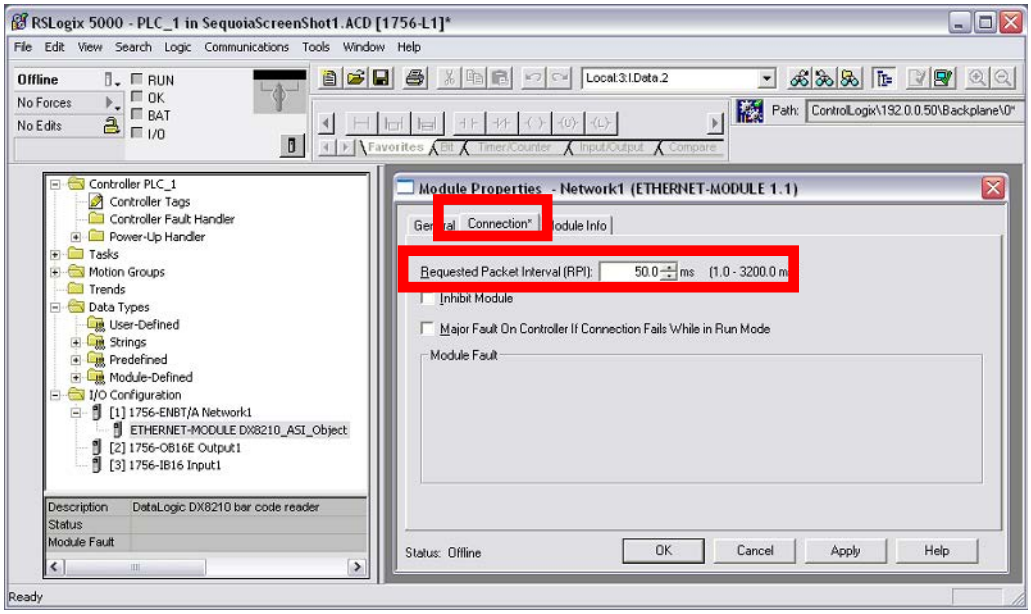


4. Specify the Name, Description and IP address of the reader.

5. Next enter the **Connection Parameters**.



6. You can only “schedule” I/O message transfers to the reader at a fixed interval. Click the **Connection Tab** and specify this interval. The reader will handle intervals down to 10 milliseconds; however, intervals this small may begin to affect the overall reader performance.



7. Click **OK**.

8. After the module definition for the reader has been completed, tags will be created in the controller based on the name you specified for this reader on the properties page for the module. These tags will consist of the name followed either by the letter **"Reader:C Configuration Data" on page 106** the **"Reader:O Output Data" on page 107** or the **"Reader:I Input Data" on page 106**. These tags are based on the reader assembly objects.

Reader:C Configuration Data

This data is not used.

Reader:I Input Data

Tag Name	Value	Description
Reader:I.Data[0]	Discrete Input Word	See bit definitions.
Reader:I.Data[1]	Bar Code Sequence Number	This field is updated every time the bar code data is updated. However, the bar code data will only be updated when the "Last Bar Code Sequence Number" (see Output Data) is set equal to this value.
Reader:I.Data[2]	Bar Code Status	Not currently used.
Reader:I.Data[3]	Bar Code Size (words)	Number of words which contain the barcode data
Reader:I.Data[4-67]	Bar Code Data	

Discrete Input Word

Bit	
0	Unused
1	Unused
2	Unused
3	Unused
4	Unused
5	Unused
6	Unused
7	Unused
8-15	Unused

Reader:O Output Data

Tag Name	Value	Description
Reader:O.Data[0]	Discrete Output Word	See bit definitions.
Reader:O.Data[1]	Last Barcode Sequence Number Received	This field must be updated to match the Bar Code Sequence Number each time the bar code data has been processed.

Discrete Output Word

Bit	Bit = 0	Bit = 1
0*	Trigger Off	Trigger On
1 – 7	Unused	Unused
8*	Reader Relay #1 Off	Reader Relay #1 On
9*	Reader Relay #2 Off	Reader Relay #2 On
10*	Reader Relay #3 Off	Reader Relay #3 On
11*	Reader Relay #4 Off	Reader Relay #4 On
12-15	Unused	Unused

I/O MESSAGING LADDER LOGIC EXAMPLE

The rung of ladder logic below shows an example of how to update the Output data register “Last Barcode Sequence Number Received” after new barcode data is present.



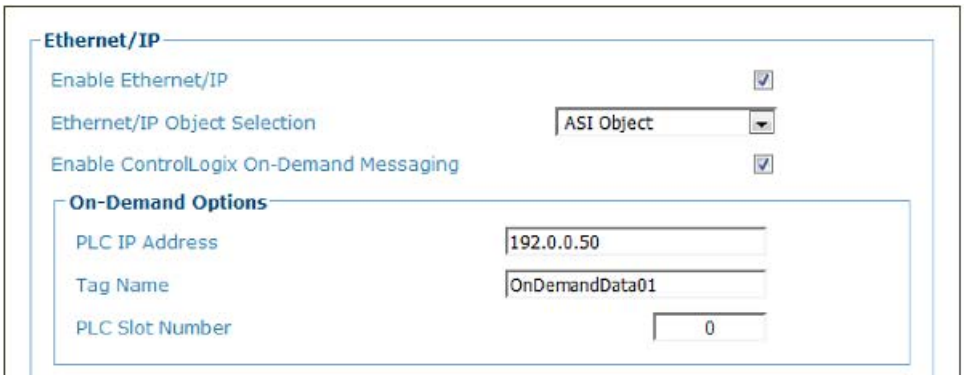
If this logic is not implemented correctly the Input data registers “Bar Code Data” will contain the data from the first read cycle after the reader boots. The **Not Equal To** instruction check for new data to bar code data must be available. When new data is available (output register is not equal to input) the rung is executed.

The **Copy File** instruction copies the bar code data to a program tag. Note that in this example the instruction moves a fixed 10 registers (10 registers will contain 20 ASCII characters).

The **Move** instruction moves the sequence number from the input registers to the output register. This lets the reader know the PLC is ready for the data from the next read cycle.

ON-DEMAND MESSAGING (CONTROLLOGIX)

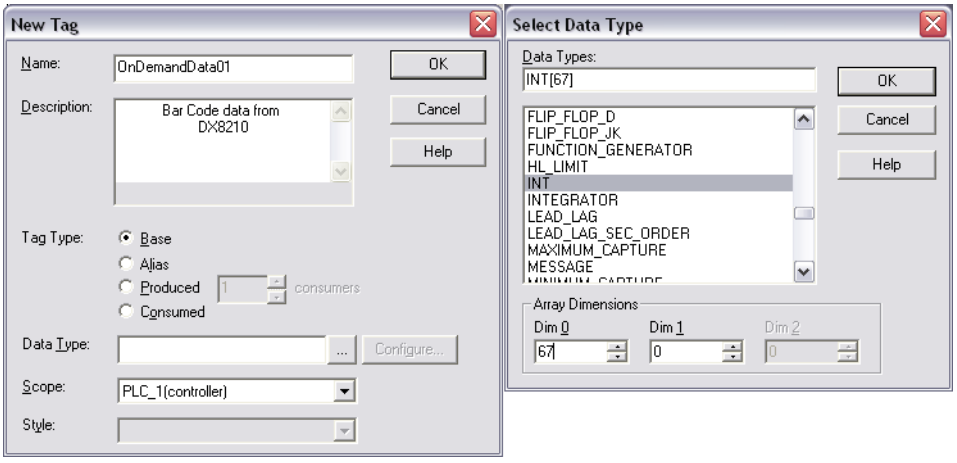
On-Demand messaging provides another option for transferring bar code data to your ControlLogix processor. With on-demand messaging, the data transfer occurs as soon as the bar code data is available, not as the result of constant messaging at a schedule interval.



For On-Demand messaging follow these steps:

1. To enable the Reader, select the check-box **Enable ControlLogix On-Demand Messaging** from the Ethernet/IP page within e-Genius.
2. Specify the IP address and slot for the ControlLogix processor.
3. Name of the Tag to contain the bar code data.
4. Specify the PLC Slot Number if necessary.

Once this is complete, you need to define a new Tag on the ControlLogix. The new tag should have a type of INT and a dimension of 67 words. The name must match the name specified on the Reader.



Once this has been completed, these tags will be updated every time a bar code is read.

On-Demand Tag

Tag Name	Value	Description
ReaderTag.Data[0]	Bar Code Sequence Number	This field is incremented every time the bar code data is updated.
ReaderTag.Data[1]	Bar Code Status	Not currently used.
ReaderTag.Data[2]	Bar Code Size (words)	Number of words which contain the barcode data
ReaderTag.Data[3-66]	Bar Code Data	

ETHERNET/IP OBJECT MODELS

This is a description of the different data types that are used in the documentation of the object model. These are standard definitions of the Open DeviceNet Vendor Association (ODVA).

Summary of Objects

The following standard objects are supported. More details can be found in the EtherNet/IP™ Specification available from the Open DeviceNet Vendors Association (ODVA).

Identity Object (01HEX)

Message Router Object (02HEX)

Assembly Object (04HEX)

Connection Manager Object (06 HEX)

TCP Object (F5HEX)

Ethernet Link Object (F6 HEX)

The following Vendor Specific Objects have been defined to support the Reader Bar Code Reader:

- Barcode Data Object (70 HEX)
- Discrete Input Data Object (71 HEX)
- Discrete Output Data Object (72 HEX)

Definitions

The following table has a description of all of the data types used.

USINT	Unsigned Short Integer (8-bit)
UINT	Unsigned Integer (16-bit)
UDINT	Unsigned Double Integer (32-bit)
STRING	Character String (1 byte per character)
BYTE	Bit String (8-bits)
WORD	Bit String (16-bits)
DWORD	Bit String (32-bits)

STANDARD OBJECTS

Identity Object (01HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Vendor Number	UINT	25DEC	Get
2	Device Type 0x00 – Generic	UINT	00HEX	Get
3	Product Code Number	UINT	01	Get
4	Product Major Revision Product Minor Revision	USINT USINT	03 01	Get
5	Status Word (see below for definition)	WORD	See Below	Get
6	Product Serial Number	UDINT	Unique 32 Bit Value	Get
7	Product Name Structure of: Product Name Size Product Name String	UINT USINT[0-32]	15 “Bar Code Reader”	Get

Status Word

Bit	Bit = 0	Bit = 1
0	No I/O Connection	I/O Connection Allocated
1 – 15	Unused	Unused

Common Services

Service Code	Implemented for		Service Name
	Class Level	Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Single
05HEX	No	Yes	Reset

Reset Service Code

Service Code	Class	Instance	Attribute	Description
05HEX	1	1	0	Force software reset
05HEX	1	1	1	Reload factory settings and reset

Message Router Object (02HEX)

This object has no supported attributes.

Assembly Object (04HEX – 4 Instances)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	81	Get

Instance 0x64 Attributes (Input Instance 1)

Attribute ID	Name	Data Type	Default Data Value	Access Rule
3	Input Data Structure of: Discrete Input Word (see below) Barcode Sequence Number Barcode Status (reserved) Barcode Size Word Barcode Data [UINT]	UINT UINT UINT UINT UINT [ ] varies (up to 64)	0 0 0 0 0	Get

Discrete Input Word

Bit	
0	Reader Programmable Output #1
1	Reader Programmable Output #2
2	Reader Programmable Output #3
3	Reader Programmable Output #4
4	Reader Programmable Output #5
5	Reader Programmable Output #6
6	Reader Programmable Output #7
7	Reader Programmable Output #8
8-15	Unused

Instance 0x70 Attributes (Output Instance 1)

Attribute ID	Name	Data Type	Default Data Value	Access Rule
3	Output Data Structure of: Discrete Output Word (see below) Last Barcode Seq. Num Received	UINT UINT	0 0	Get / Set

Discrete Output Word

Bit	Bit = 0	Bit = 1
0*	Trigger Off	Trigger On
1 – 7	Unused	Unused
8*	Reader Relay #1 Off	Reader Relay #1 On
9*	Reader Relay #2 Off	Reader Relay #2 On
10*	Reader Relay #3 Off	Reader Relay #3 On
11*	Reader Relay #4 Off	Reader Relay #4 On
12-15	Unused	Unused

Instance 0x80 Attributes (Configuration Instance)

Most I/O clients include a Configuration path when opening an I/O connection to a server. There is no Configuration data needed.

Instance 0x81 Attributes (Heartbeat Instance – Input Only)

This instance allows clients to monitor input data without providing output data.

Common Services

Service Code	Implemented for		Service Name
Class Level		Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Single
10HEX	No	Yes	Set_Attribute_Single

Connection Manager Object (06 HEX)

This object has no attributes.

TCP Object (F5HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Status	DWORD	1	Get
2	Configuration Capability	DWORD	0	Get
3	Configuration Control	DWORD	0	Get
4	Physical Link Object Structure of: Path Size Path	UINT Array Of WORD	2 0x20F6 0x2401	Get
5	Interface Configuration Structure of: IP Address Network Mask Gateway Address Name Server Name Server 2 Domain Name Size Domain Name	 UDINT UDINT UDINT UDINT UDINT UINT STRING	 0 0 0 0 0 0 0	Get
6	Host Name Structure of: Host Name Size Host Name	 UINT STRING	 0 0	Get

Common Services

Service Code	Implemented for		Service Name
Class Level		Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Sin-gle

Ethernet Link Object (F6 HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Interface Speed	UDINT	100	Get
2	Interface Flags	DWORD	3	Get
3	Physical Address	USINT Array[6]	0	Get

Common Services

Service Code	Implemented for		Service Name
	Class Level	Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Single

VENDOR SPECIFIC OBJECTS

Barcode Data Object (70 HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Barcode Sequence Number	UINT	0	Get
2	Barcode Status (reserved)	UINT	0	Get
3	Barcode Data Size	UINT	0	Get
4	Barcode Data	UINT[ ] varies (up to 64)	0	Get
5	Last Barcode Seq. Num Received	UINT	0	Get / Set

Common Services

Service Code	Implemented for		Service Name
Class Level		Instance Level	
0EHEX	Yes	Yes	Get Attribute Single
10HEX	No	Yes	Set Attribute Single

Discrete Input Data Object (71 HEX - 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
3	Discrete Input Word	UINT	0	Get

Discrete Input Word

Bit	
0	Reader Programmable Output #1
1	Reader Programmable Output #2
2	Reader Programmable Output #3
3	Reader Programmable Output #4
4	Reader Programmable Output #5
5	Reader Programmable Output #6
6	Reader Programmable Output #7
7	Reader Programmable Output #8
8-15	Unused

Common Services

Service Code	Implemented for		Service Name
Class Level		Instance Level	
0EHEX	Yes	Yes	Get Attribute Single

Discrete Output Data Object (72 HEX – 1 Instance)

Class Attributes

Attribute ID	Name	Data Type	Data Value	Access Rule
1	Revision	UINT	1	Get

Instance Attributes

Attribute ID	Name	Data Type	Default Data Value	Access Rule
3	Discrete Output Data	UINT	0	Get / Set

Discrete Output Word

Bit	Bit = 0	Bit = 1
0*	Trigger Off	Trigger On
1 – 7	Unused	Unused
8*	Reader Relay #1 Off	Reader Relay #1 On
9*	Reader Relay #2 Off	Reader Relay #2 On
10*	Reader Relay #3 Off	Reader Relay #3 On
11*	Reader Relay #4 Off	Reader Relay #4 On
12-15	Unused	Unused

Common Services

Service Code	Implemented for		Service Name
	Class Level	Instance Level	
0EHEX	Yes	Yes	Get_Attribute_Single
10HEX	No	Yes	Set_Attribute_Single

APPENDIX C
EBC CONNECTION MODULE™



EBC (Ethernet Based Connectivity) is a network normally used for Laser Scanner interoperability.

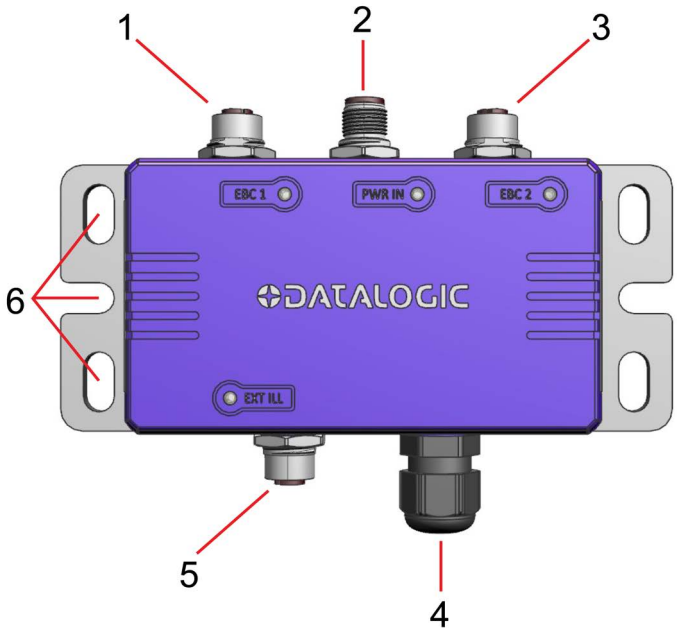
Thanks to the EBC Connection Module™, Matrix readers and Laser Scanners can be connected to the same network as Slave devices using a SC5100 Controller as a Master.

PACKAGE CONTENT

Verify that the EBC Connection Module and all the parts supplied with the equipment are present and intact when opening the packaging. The list of parts includes:

- EBC Connection Module
- Installation Manual
- Mounting screws and washers (2)
- M12 protective caps (3)

GENERAL VIEW

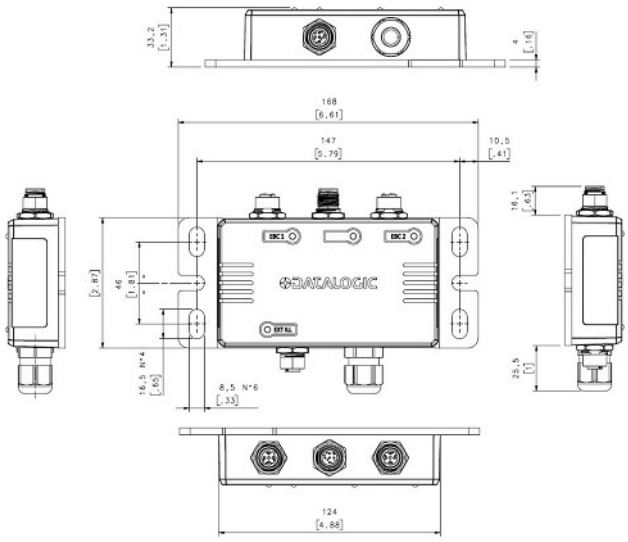


1. EBC 1 connector and LED	**4.** Pigtail connector
2. PWR IN connector and LED	**5.** EXT ILL connector and LED
3. EBC 2 connector and LED	**6.** Mounting slots (6)

MECHANICAL INSTALLATION

The EBC Connection Module is intended to be installed on Bosch frames with common T-head bolts. Alternatively, the screws and washers provided in the kit can be used.

The diagram below gives the overall dimensions of the module.



SYSTEM WIRING/CABLING

The connection and wiring procedure for the EBC Connection Module is described as follows:

1. Make sure that all EBC Connection Module M12 connectors are not connected.
2. Use the PWR Cable AS-I to M12 crimping it on the AS-I Bus as described in the instructions included in the AS-I cable package.
3. Connect the power supply cable to the PWR IN connector (with no other devices connected) and apply power. The blue LEDs of the PWR IN and EXT ILL connectors will turn on.
4. Once the proper connection to the power supply is established, disconnect the power supply.
5. Connect the M12 pigtail connector to the Matrix reader.
6. Connect the ETH ports to other devices in the EBC ring.
7. If desired, connect EXT ILL to an External Illuminator. If the connector is not used, do not remove the protective cap.
8. Power on the device.



WARNING: To guarantee the module GND connection to Earth, the Bosch frame on which the module is mounted must be connected to Earth.

INDICATOR LEDs

There are four indicator LEDs.

PWR IN and EXT ILL

These LEDs light up blue when power is properly applied to the EBC Connection Module.

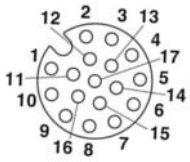
EBC 1

This LED blinks yellow when there is Link Activity on Port 1.

EBC 2

This LED blinks yellow when there is Link Activity on Port 2.

ELECTRICAL CONNECTIONS



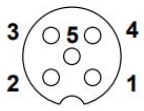
Pigtail connector - M12 17 poles female

PIN	NAME	DESCRIPTION
1	Vdc	24 V power supply input voltage + for Matrix readers
2	GND	24 V power supply input voltage - for Matrix readers
3	/	
4	RS232_RX	AUX Serial RX
5	/	
6	/	
7	/	
8	OUT2	Digital Output 2
9	/	
10	RS422_TXN	MAIN Serial TX-
11	RS422_TXP	MAIN Serial TX+
12	RS422_RXN	MAIN Serial RX-
13	/	
14	RS232_TX	AUX Serial TX
15	/	
16	OUT3	Digital Output 3
17	RS422_RXP	MAIN Serial RX+



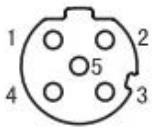
PWR IN connector - M12 5 poles male

PIN	NAME	DESCRIPTION
1	Vcc	24 V power supply input voltage + for EBC module
2	/	
3	GND	24 V power supply input voltage - for EBC module
4	/	
5	/	



EXT ILL connector - M12 5 poles female

PIN	NAME	DESCRIPTION
1	Vcc	24 V power supply input voltage + for Ext. Illuminator
2	/	
3	GND	24 V power supply input voltage - for Ext. Illuminator
4	STROBE	Strobe signal for External Illuminator
5	/	



Ethernet connector - M12 5 poles female

PIN	NAME	DESCRIPTION
1	TX+	Ethernet TX+
2	RX+	Ethernet RX+
3	TX-	Ethernet TX-
4	RX-	Ethernet RX-
5	/	

SOFTWARE CONFIGURATION

Adding new devices to the network

1. Make sure to have the latest software versions installed on all devices used in the EBC network.
2. Connect to the SC5100 web page by:
   • entering the SC5100 IP address in the browser (default 192.168.1.100), OR
   • clicking on the SC5100 icon under the Device Selection menu in DL.CODE.
   Then log on to e-Genius (refer to the SC5100 Product Reference Guide for more information).
3. From DL.CODE, click on the SC5100 icon under the Device Selection menu and connect to the device.
4. From e-Genius, go to System Info > EBC Devices.
5. Assign an ID node to the devices to be connected to the network. Note that all devices outside the EBC network appear at the bottom of the page. If the list is empty, click Discover Scanners and wait. Then add the node ID to the discovered devices.
6. Click on **Update All** to confirm the new configuration.

Configuration

7. From e-Genius, go to Global Settings > Operating Mode, and select the operating mode for your application.



NOTE: The Matrix reader does not support Continuous mode.

8. Go to Global Settings > Barcode Settings Table and select the symbologies to decode.
9. From DL.CODE, connect to the Matrix reader to start configuration (it will appear under the SC5100 cluster).
10. Configure the Matrix reader according to the Operating Mode selected on the SC5100.

ACCESSORIES

Accessory	Order No.
PWR IN cables	
AS-I to M12 straight - 1mt	93ACC0067
AS-I to M12 straight - 2mt	93ACC0068
Ethernet cables	
ETH Cable M12-M12 (Straight-Straight) - 1mt	93A050065
ETH Cable M12-M12 (Straight-Straight) - 3mt	93A050066
ETH Cable M12-M12 (Straight-Straight) - 5mt	93A050067
Illuminator cables	
CBL-1480-01 M12/5P MALE/FEMALE 1M IDNET	93A050049
CBL-1480-02 M12/5P MALE/FEMALE 2M IDNET	93A050050

*For a complete list of the available accessory cables, see the product page on www.data-logic.com.

TYPICAL LAYOUTS

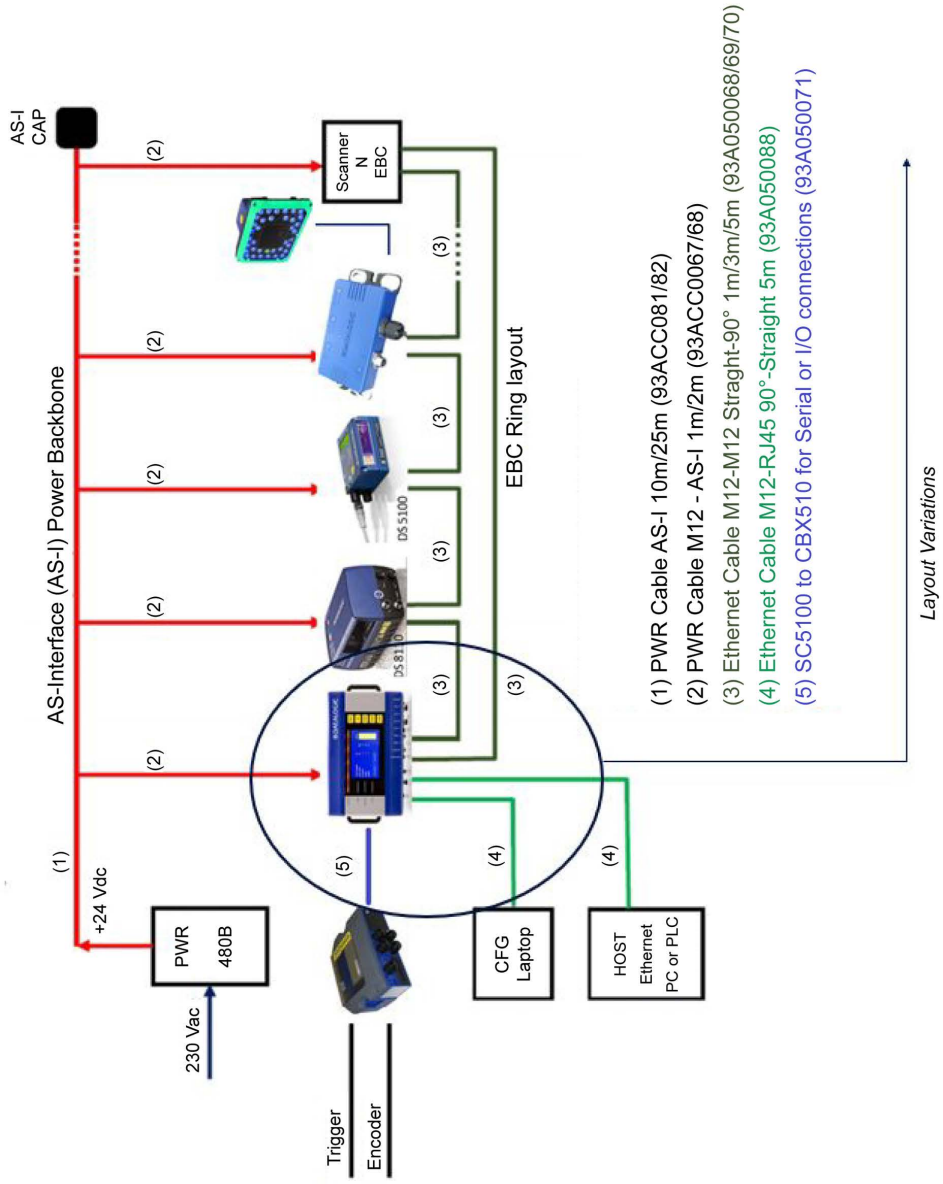
Large Synchronized Network Layout

The SC5100 controller can be connected to the host in several different layouts, depending on the controller model and host interfaces.

External devices (e.g. presence sensor, encoders) are all connected to the SC5100 through a CBX510 connection box using one of the two I/O connectors.

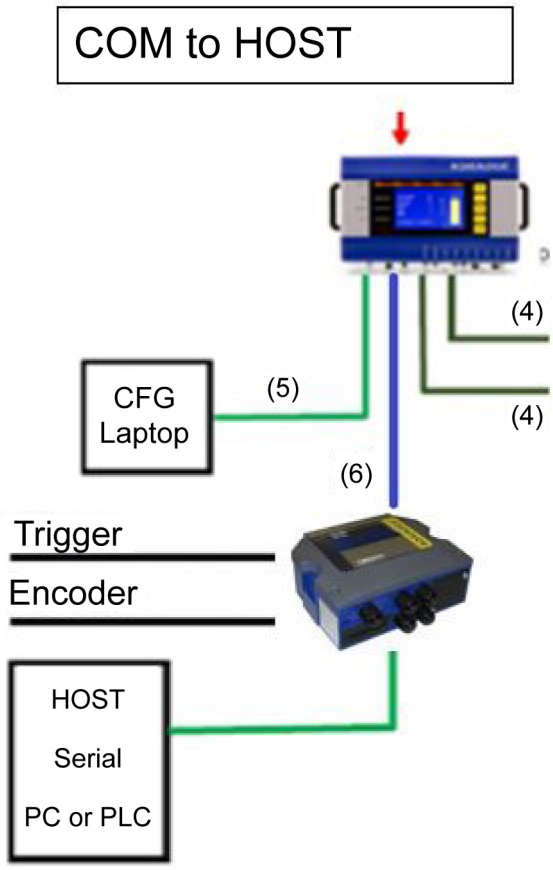
Ethernet TCP/IP to Host

The host can be connected to the controller through an Ethernet direct cable or through a hub/switch:



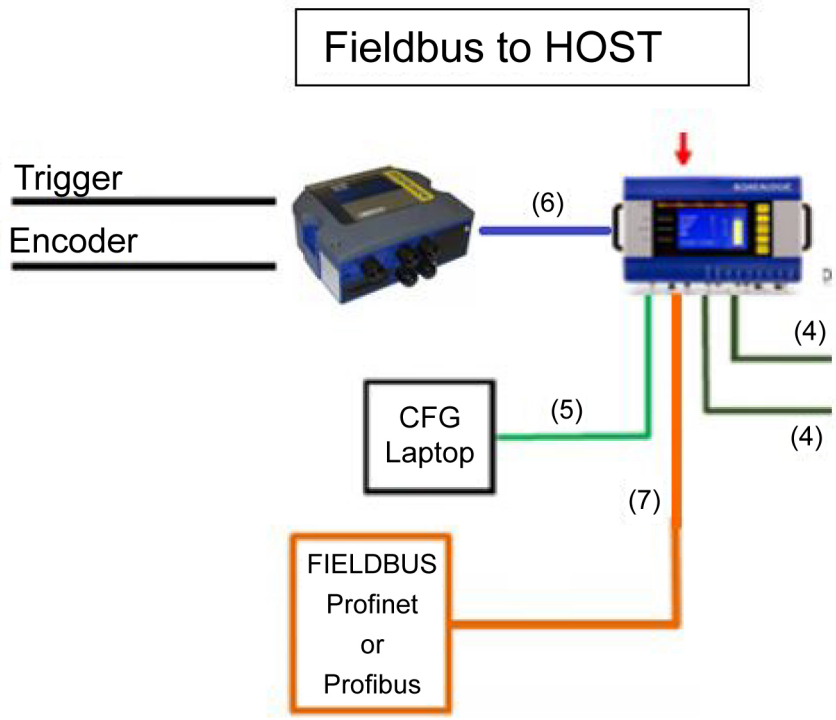
COM to Host

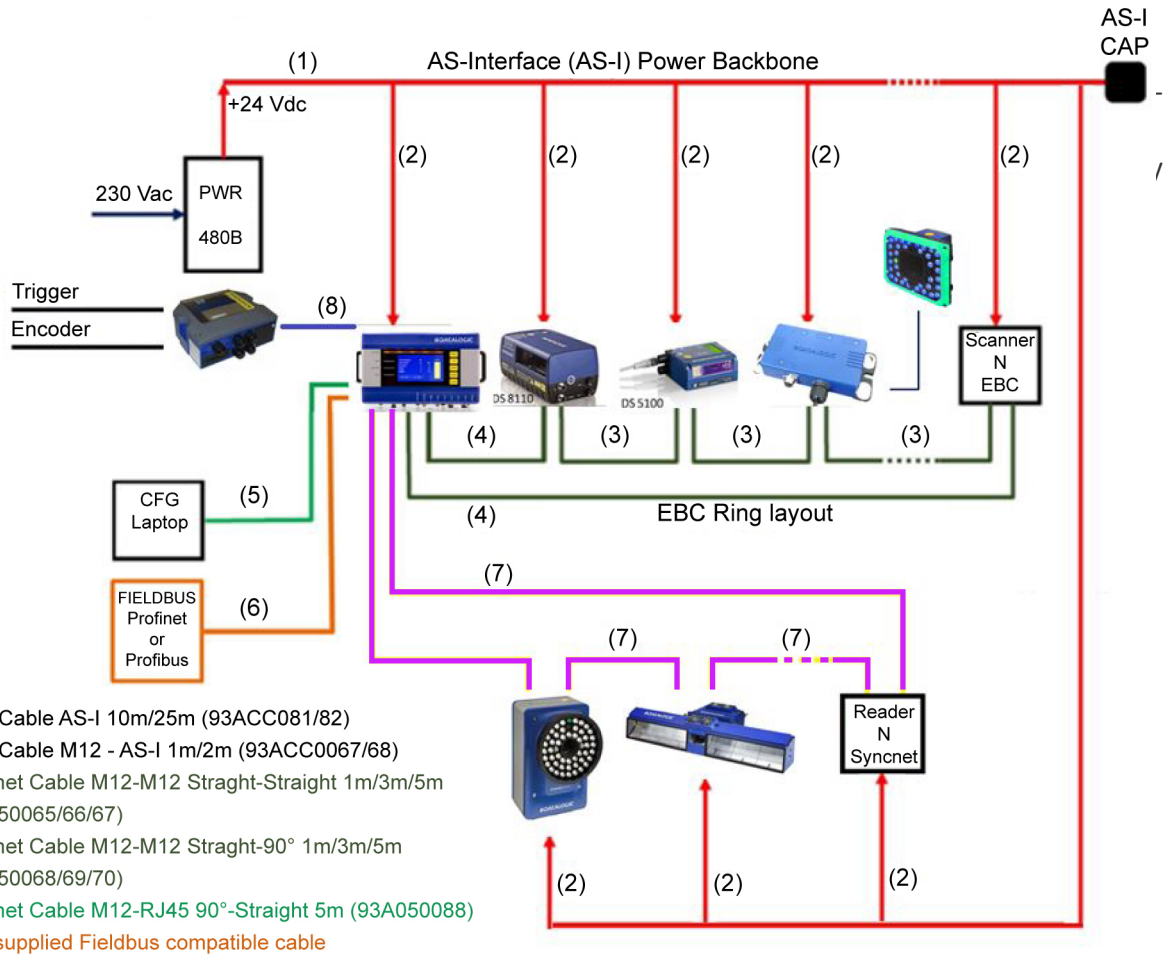
The host can be connected via COM (RS232 or RS422) to the controller through a CBX510.



Fieldbus to Host

The host can be connected to a SC5100 dedicated Fieldbus model.



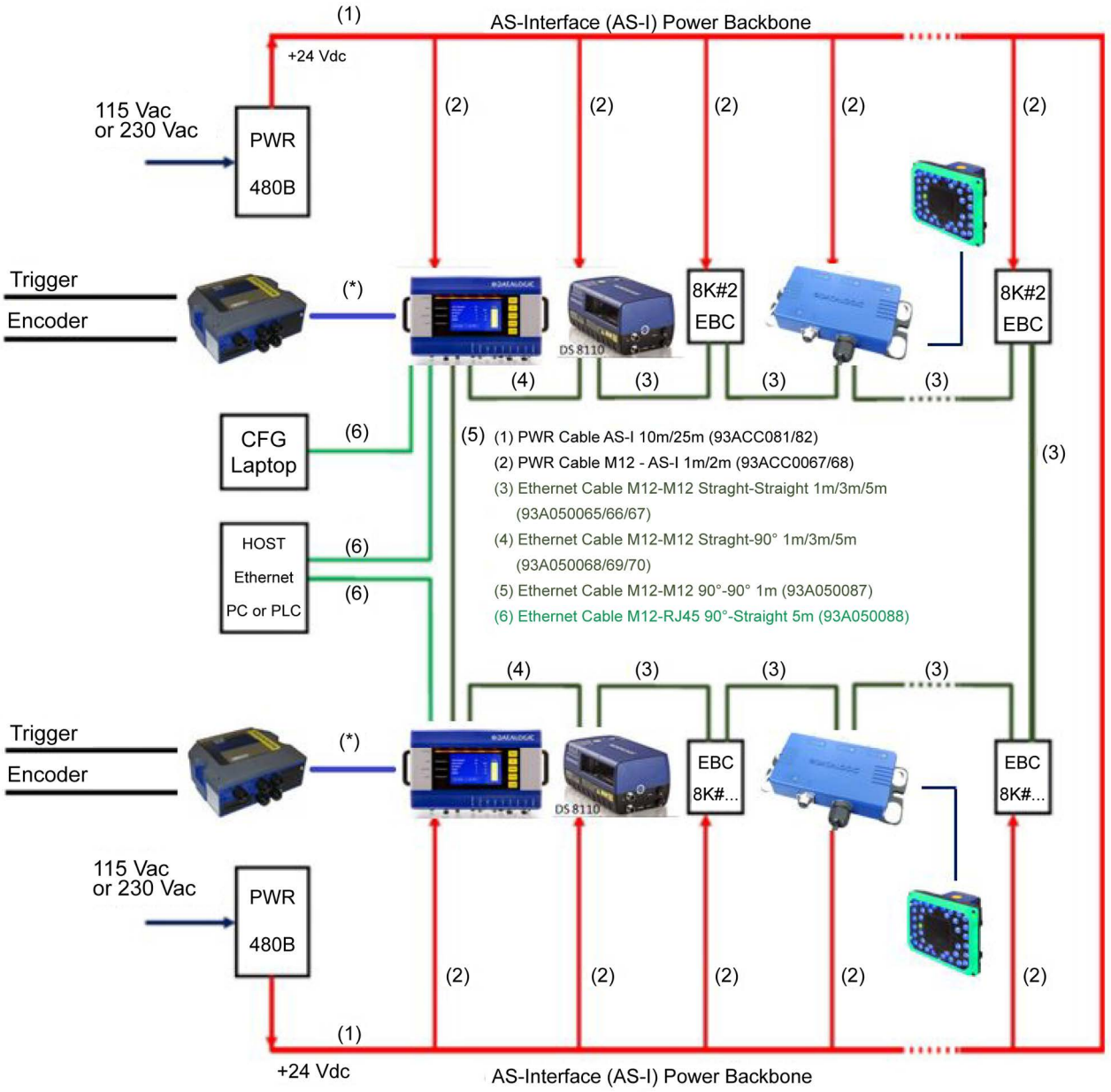


(1) PWR Cable AS-I 10m/25m (93ACC081/82)
(2) PWR Cable M12 - AS-I 1m/2m (93ACC0067/68)
(3) Ethernet Cable M12-M12 Straght-Straight 1m/3m/5m (93A050065/66/67)
(4) Ethernet Cable M12-M12 Straght-90° 1m/3m/5m (93A050068/69/70)
(5) Ethernet Cable M12-RJ45 90°-Straight 5m (93A050088)
(6) User supplied Fieldbus compatible cable
(7) Syncnet Connection Cable 2m/5m/10m (93A050070/80/01)
(8) SC5100 to CBX510 for Serial or I/O connections (93A050071)

Redundant System Layout

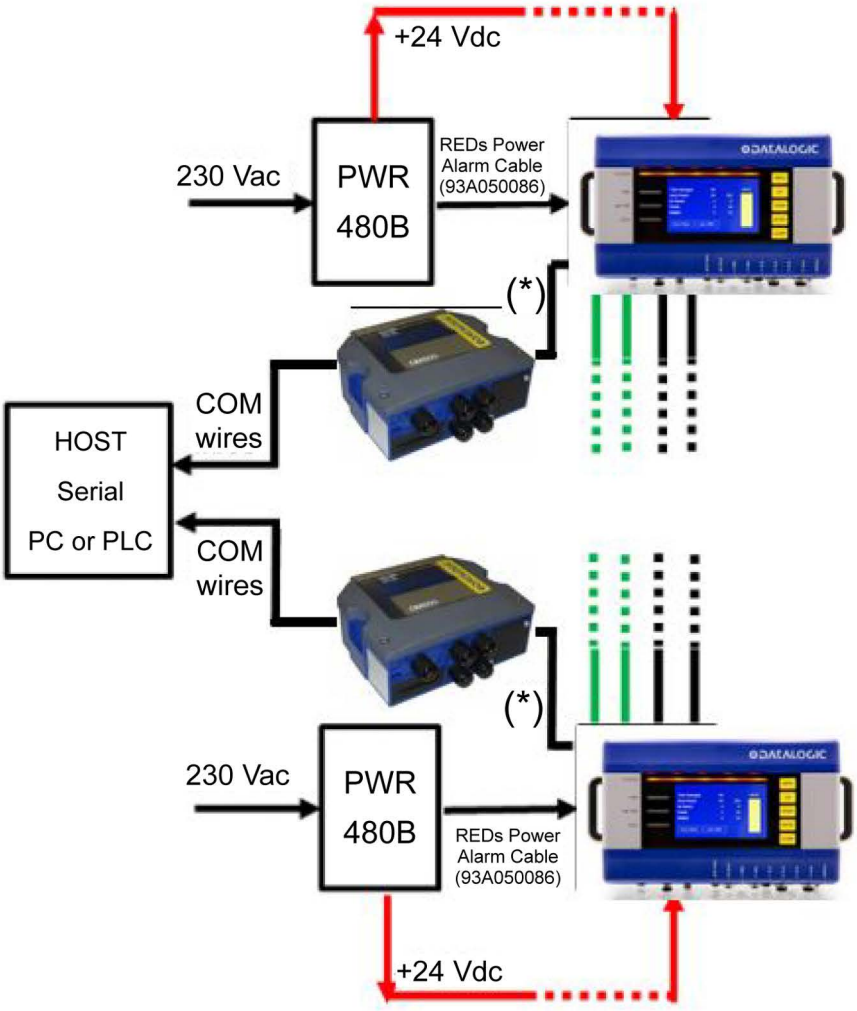
For large local EBC networks, a redundant system can be configured in which two controllers are used together with their respective PWR power supply units. The scanners are distributed equally between the PWR units.

In this case, one of the controllers acts as a Working Master or active unit, while the other serves as a Protecting Master or backup unit.



Redundant System Layout with Host supporting Serial COM Communications

A host that supports COM communications can be connected to the controller through a CBX510 (one for each controller).



(*) SC5100 to CBX510 for Serial or I/O connections (93A050071)

TECHNICAL SPECIFICATIONS

ELECTRICAL FEATURES	
Power	
Supply Voltage	24 Vdc
Consumption *	0.05 A
Overcurrent protection	2.6 A

* Consumption of the EBC Connection Module alone. Total Power Consumption is given by adding the EBC Connection Module power consumption to that of all the devices powered through the EBC Connection Module (reading device, illuminator). Refer to the manuals of the connected devices for details about their power consumption.

COMMUNICATION INTERFACES	
Ethernet	Pigtail (up to 10 Mbps) EBC (10/100 Mbps)

USER INTERFACE	
LED indicators	Power In (Blue) External Illuminator (Blue) 2 EBC Links (Orange)

PHYSICAL FEATURES	
Dimensions	H x W x L 170 x 72 x 32 mm (6.7 x 2.8 x 1.3 in)
Pigtail cable length	50 mm (2 in)
Weight	435 g (15.3 oz)
Material	Aluminum

ENVIRONMENTAL FEATURES	
Operating temperature	-10 to 50 °C (+14 to 122 °F)
Storage temperature	-20 to 70 °C (-4 to 158 °F)
Humidity max.	90% non condensing
Sinusoidal vibration resistance EN 60068-2-6	14 mm @ 2 to 10 Hz; 1.5 mm @ 13 to 55 Hz; 2 gn @ 70 to 500 Hz; 2 hours on each axis
Bump resistance EN 60068-2-29	30 g; 6 mm; 5000 shocks on each axis
Shock resistance EN 60068-2-29	30 g; 11 ms; 3 shocks on each axis
Protection class EN 60529	IP65 and IP67**

** When all the M12 connectors and reading devices are correctly connected (or closed with proper protection caps).

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821007241 Rev. C October 2024