

REFERENCE MANUAL



> SC6000



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SC6000 Reference Manual

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REFERENCES

REFERENCE DOCUMENTATION

The documentation related to the SC6000 is listed below:

- PWO power supply unit
- Document about the Ethernet connectivity
- Document about the Profibus connectivity
- Guide to Installing a Redundant System
- Replacing an SC8000 Controller
- Help On-Line in PDF format

SUPPORT THROUGH THE WEBSITE

Datalogic provides several services as well as technical support through its website. Log on to www.datalogic.com and click on the **SUPPORT > Unattended Scanning Systems** category link. From this page you can select your product model from the dropdown list which gives you access to:

- Downloads including Data Sheets, Manuals, Software & Utilities, and Drawings;
- Repair Program for On-Line Return Material Authorizations (RMAs) plus Repair Center contact information;
- Service Program containing details about Maintenance Agreements;
- Technical Support through email or phone.

PATENTS

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

This product is covered by one or more of the following patents.

Utility patents: JP4033958B2, US6347740, US6629639

COMPLIANCE

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 own expense.

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.

POWER SUPPLY

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

GENERAL VIEW

SC6000 Controller

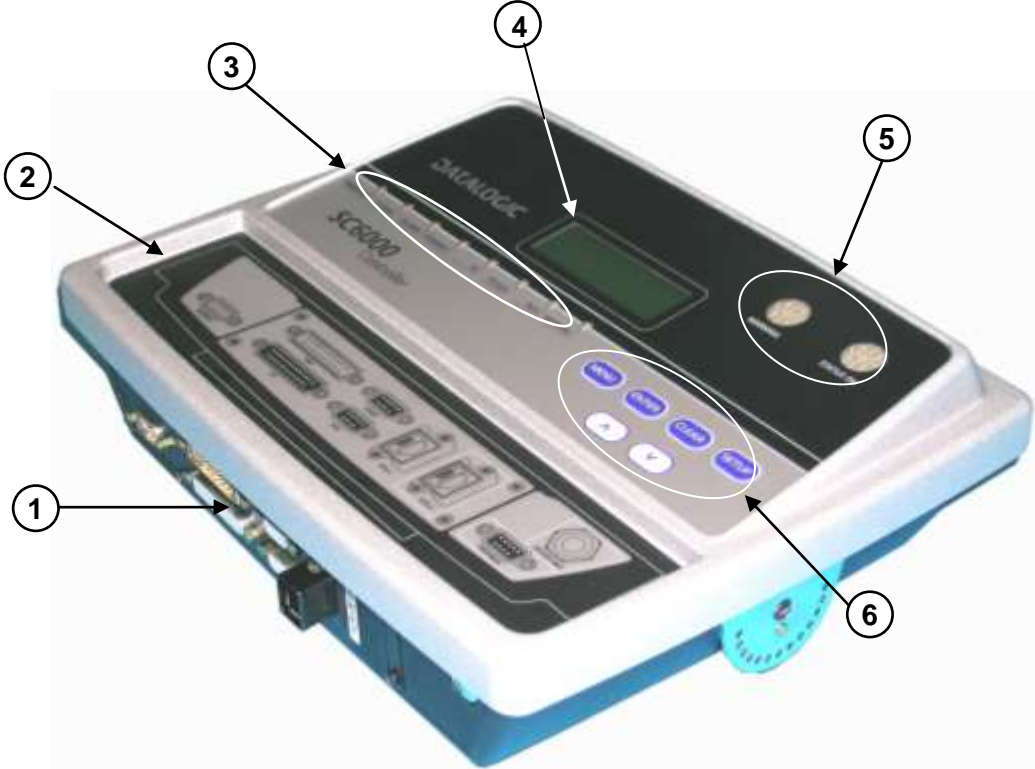


Figure A - General View

- | | |
|-----------------------------------|----------------------|
| ① Connector Panel | ④ LCD Display |
| ② Connector Panel Legend | ⑤ Status LEDs |
| ③ Power On and Communication LEDs | ⑥ Programming Keypad |

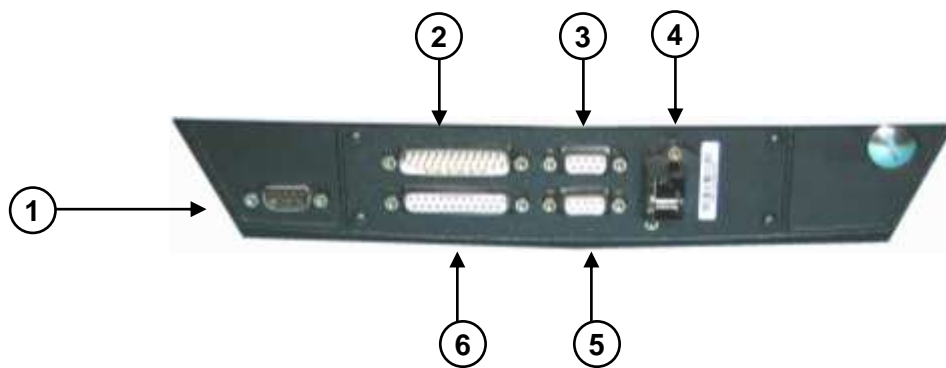


Figure B - SC6000-1200 Standard Model Connector Panel

- ① Modem Connector
- ② Power/Net Connector
- ③ Main Interface Connector
- ④ Ethernet Connector
- ⑤ Auxiliary Interface Connector
- ⑥ Extended I/O Connector



Figure C - SC6000-1211 Profibus Model Connector Panel

- ① Profibus Connector



Figure D - SC6000-1215 DeviceNet Model Connector Panel

- ① DeviceNet Connector



Figure E - SC6000-1230 Dual Ethernet Model Connector Panel

- ① Ethernet Connector

GUIDE TO INSTALLATION

The following can be used as a checklist to verify all the steps necessary to complete installation of the SC6000 Controller.

- 1) Read all information in the section “Compliance” at the beginning of this manual.
- 2) Correctly mount the SC6000 using the bracket provided according to the information in par. 2.3.
- 3) Connect the SC6000 Controller to the PWO by means of the appropriate accessory cables (see par. 1.4).
- 4) Provide correct and complete system cabling through the PWO according to the signals (Lonworks, encoder P.S., etc) necessary for the layout of your application. (See subparagraphs under par. 2.4 and 2.5. See also the PWO Installation Manual).
- 5) Install the Genius™ configuration program onto a laptop PC from the CD-ROM provided. Configure the SC6000 Controller by connecting this PC to the SC6000 Auxiliary port.

For configuration of a cluster of DS6000 family scanners, or DS8100A/DX8200A scanners or both, see par. 3.2.

For configuration of a cluster of DS8100 or DX8200 scanners or both, see par. 3.3.
- 6) Execute the Backup procedure described in par. 4.1.
- 7) Exit the configuration program and run your application.

The installation is now complete.

1 INTRODUCTION

1.1 PRODUCT DESCRIPTION

The new SC6000 Controller offers all the necessary functions to make the phases of installation, setup, testing, and maintenance of the omni-directional reading tunnel easy and quick.

The SC6000 Controller key functions are:

- Bus Controller: cluster management and Host interface of a multisided reading tunnel based on Lonworks bus;
- DARP™ (Datalogic Automatic Replacement Procedure) function: automatic procedure for scanner and bus controller replacement;
- Diagnostic indications on the reading station status, simple to be detected without any PC needed. This indications, based on LEDs and display, offer to the maintenance staff all the necessary information;
- Easy remotization of all the reading station information, thanks to built-in Ethernet and fieldbus connectivity, and a dedicated 9-pin connector for Modem connection;
- Single and Redundant System configurations;
- Integration with RFID and Vision Systems; SC6000's efficiency in hybrid solutions represents a crucial competitive advantage for challenging application requirements.
- Auto PackTrack™ Calibration procedure from SC6000 Menu using the onboard Keypad and Display.
- Energy Saving allows allows turning on/off the motors and lasers of all network scanners according to the selected digital input, encoder, or communication channel. The time required to restart the system is less than 1 minute independently from the number of scanners connected. It is suggested to use this parameter for example when the conveyor is stopped for a lengthy period.

The SC6000 Controller is based on a robust alloy case divided into two parts: on the upper part there is the display, the keypad and the LEDs. The lower part contains the motherboard, the removable Compact-Flash memory, the Fieldbus boards and the connector panel.

The simple and sturdy mechanical structure makes the SC6000 Controller the ideal solution for industrial environments.

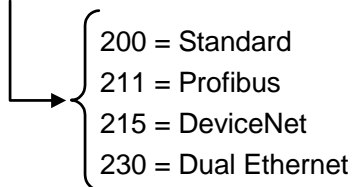
The SC6000 Controller is fully compatible both with the 6000 family and with the 8000 family (DS8100A and DX8200A) scanners. This means that the SC6000 Controller can work as a bus controller for a cluster of DS6000 family scanners, or DS8100A/DX8200A scanners or both. These slave scanner families no longer require a staggered starting sequence, therefore SC6000 starts them simultaneously.

The SC6000 Controller is also compatible with DS8100 and DX8200 (Lonworks versions). It is not possible to mix DS8100/DX8200 with 6000 family or DS8100A/DX8200A.

1.2 MODEL DESCRIPTION

The SC6000 Controller is available in versions that differ in regard to the following characteristics:

SC6000 - 1XXX



1.3 LED INDICATORS



Figure 1 – LEDs Description

① Power ON and Communication LEDs

② Status LEDs

System Signal LEDs

Name	Color	State	Function
Power ON	Green	ON OFF	SC6000 Powered No Power
Tx Data	Green	Blinking OFF	Transmitting Data on MAIN No Data Transmission
Rx Data	Green	Blinking OFF	Receiving Data on MAIN No Data Reception
Ethernet	Red	ON OFF	Ethernet Line Connected No Ethernet Line Connected
PS	Yellow	ON OFF	Presence Sensor Active Presence Sensor Not Active
PS Aux	Yellow	ON OFF	Presence Sensor Active Presence Sensor Not Active
Tach	Yellow	Blinking OFF	Encoder Active Encoder Not Active
Network	Red	ON OFF	Lonworks OK Lonworks Error

System Event Status LEDs

Name	Color	State	Function
Warning	Red	ON	Scanner Cluster Failure
		Blinking	Scanner Cluster Warning (if enabled in Genius)
		OFF	Scanner Cluster OK
Status OK	Green	ON	Controller Status OK
		OFF	Controller Failure

1.4 ACCESSORIES

The following accessories are necessary to build a reading station based on SC6000 (the scanner-related accessories are not included):

Name	Description	Part Number
CAB – SC6003	25-pin cable SC6000 to PWO, 3m (for Extended I/O connections)	93A051338
CAB – SC6013	25-pin cable SC6000 to PWO, 3m (for Power/Net connections)	93A051337
CAB – SC6103	9-pin cable SC6000 to PWO, 3m (for Main Host and Modem connections)	93A051294
CAB – PWO 03	17-pin cable PWO to PWO, 3m (for redundancy)	93A051295
PWO-480	Power & Connect System, 480W	93ACC1767
Modem	INSYS Modem 56K	93A051294

2 INSTALLATION

To install the system follow the given procedure:

- 1) Select the mounting location and mount the SC6000 Controller;
- 2) Mount the PWO (refer to the PWO Installation Manual);
- 3) Proceed with system electrical connections;
- 4) Install the Genius™ program on the configuration PC.

**NOTE**

If your system requires the SC6000 to be connected to PWO refer to the Reference Documentation section for details.

2.1 PACKAGE CONTENTS

Verify that the SC6000 Controller and all the parts supplied with the equipment are present and intact when opening the packaging; the list of parts includes:

- SC6000 Controller
- Installation Quick Reference
- SC6000 Configuration CD-ROM
- Mounting brackets with knobs and washers

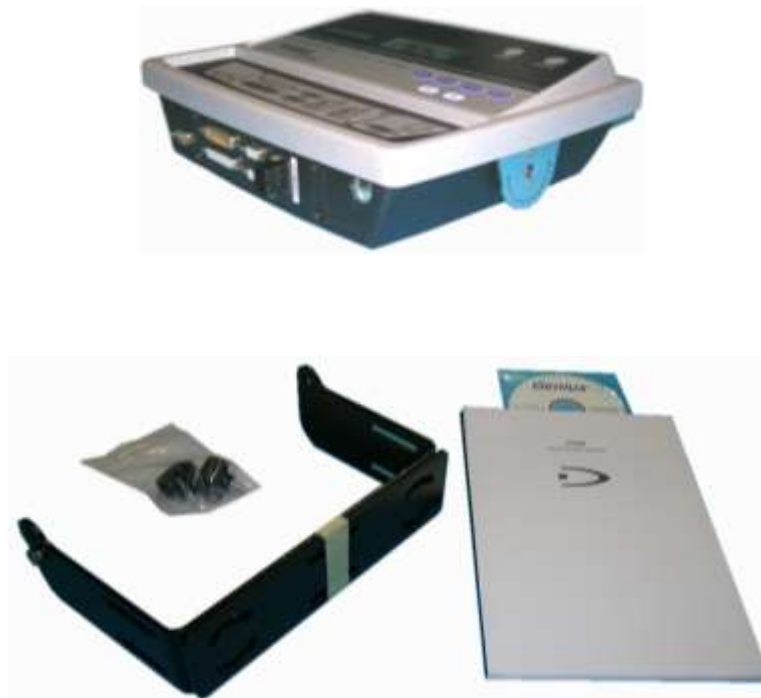


Figure 2 – SC6000 Package Contents

2.2 OVERALL DIMENSIONS

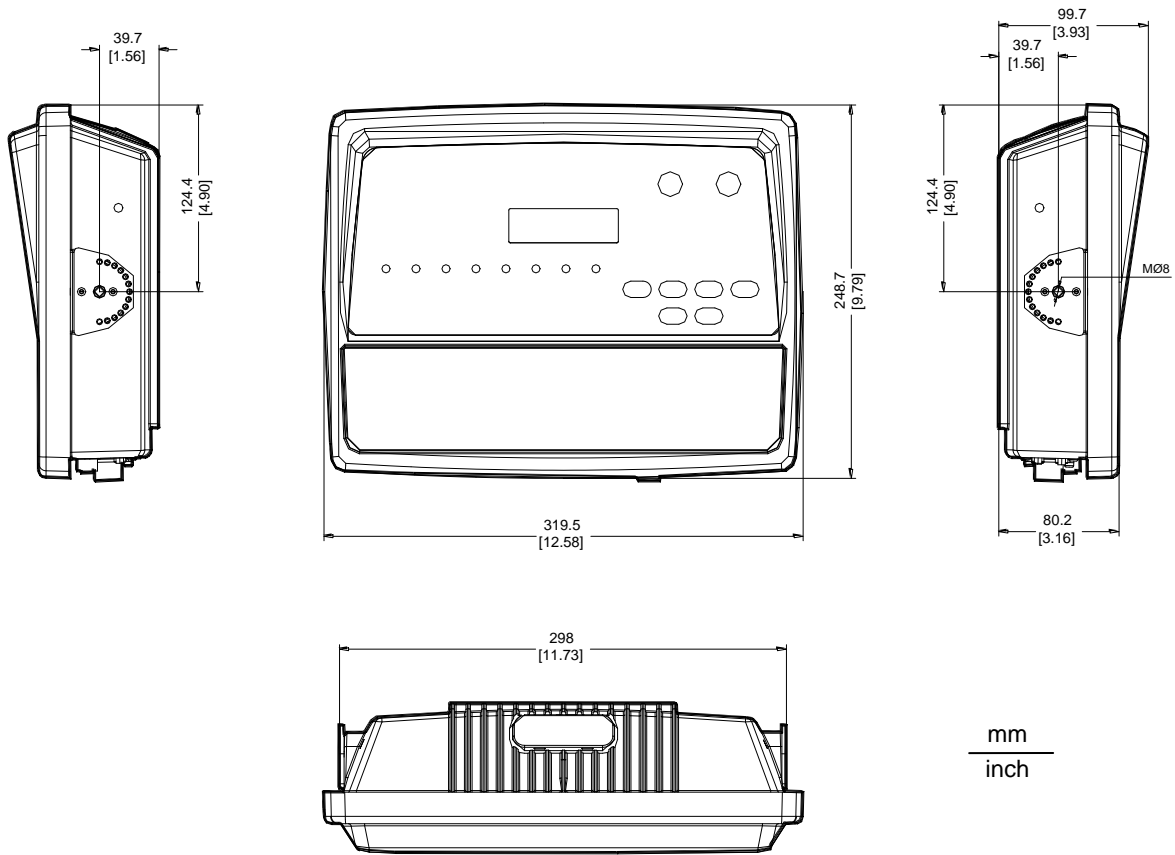


Figure 3 – SC6000 Overall Dimensions

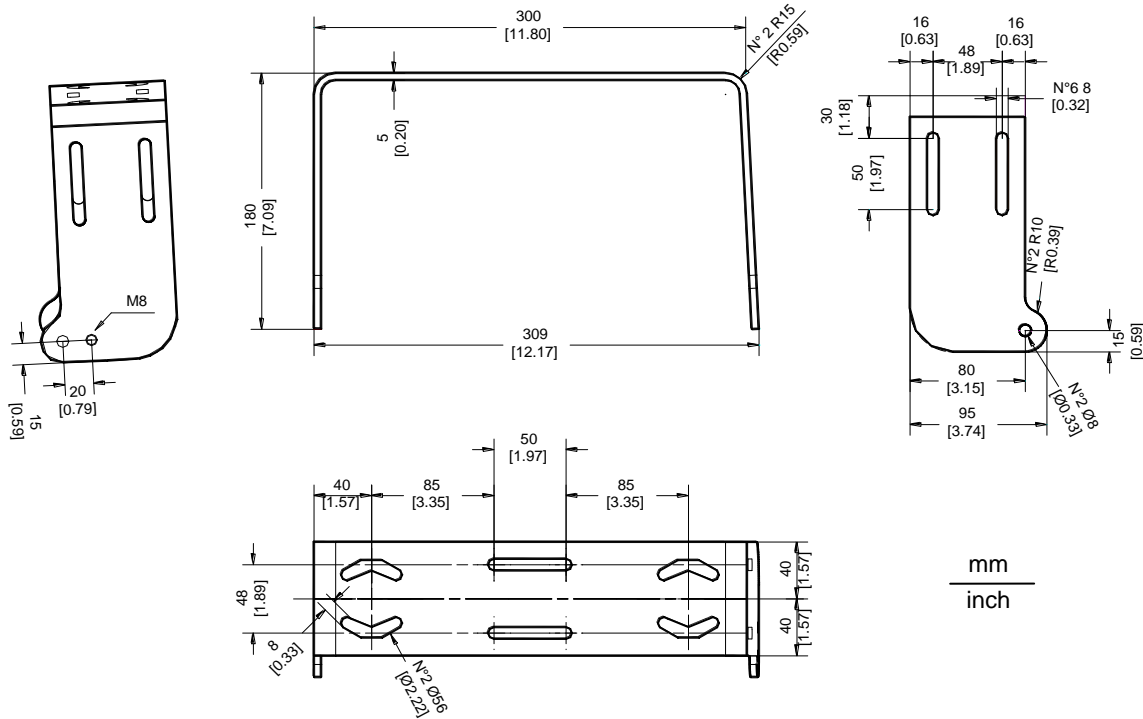


Figure 4 – ST-222 Bracket Overall Dimensions

2.3 MECHANICAL MOUNTING

To mount the SC6000 Controller on the reading station frame proceed as follows:

- 1 Mount the bracket on the reading station frame: the slots on the bracket will help obtain the best positioning. When working in environments characterized by strong vibrations, set the screws as close as possible to the bracket edges, see Figure 5.
- 2 Tighten the ST-222 bracket to the reading station frame using the screws and washers.

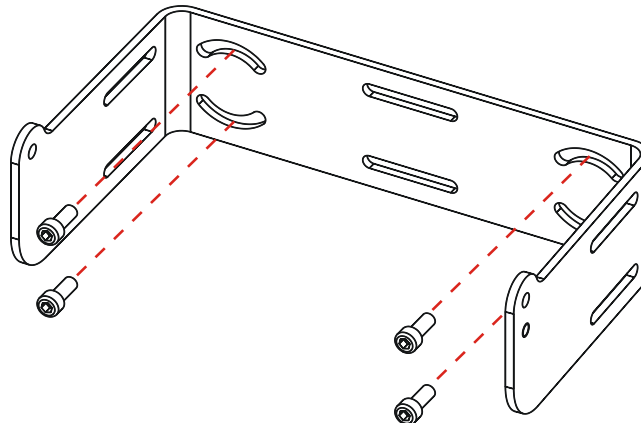


Figure 5 – Mounting the bracket on the reading station frame

- 3 Position the SC6000 Controller at the top of the bracket: make sure the two large round openings coincide to the ones located at the edges of the SC6000 Controller.
- 4 While supporting the SC6000 Controller, rotate the whole device until it is aligned for the best viewing position, then insert the set pin screw with locking washer until it inserts into one of the small positioning holes located on the terminal bracket.

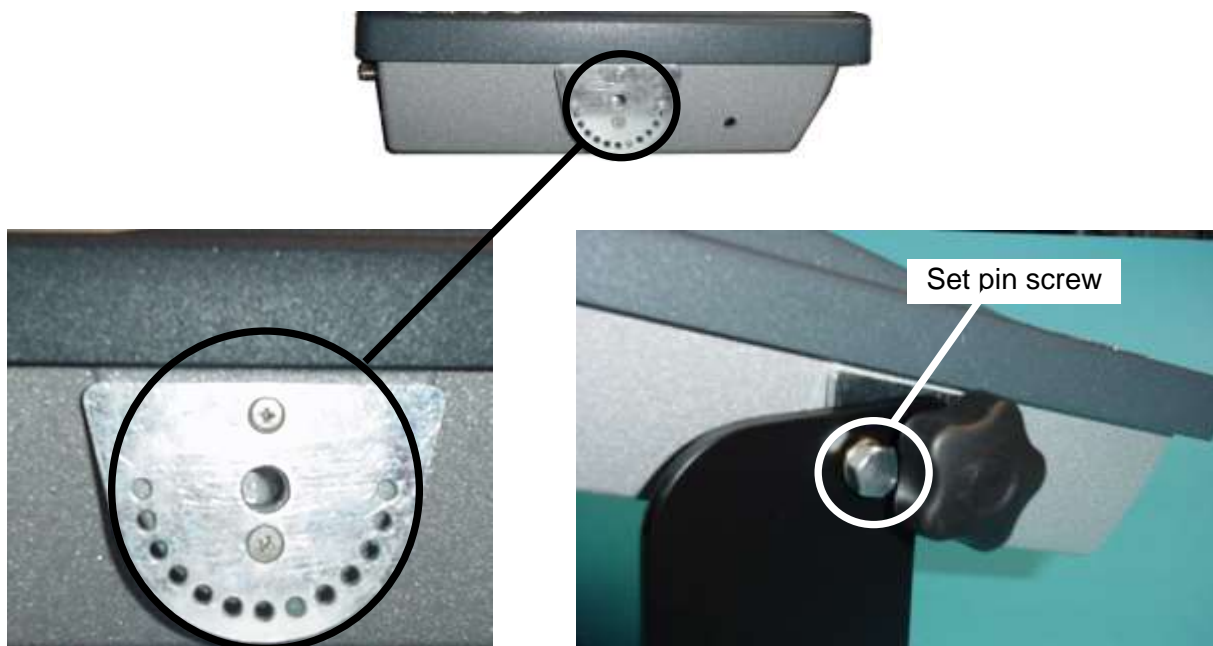


Figure 6 – SC6000 Controller Side View with Punched Steel Ring and Relative Set Pin Screw

The specially punched steel ring has been designed to obtain the most precise rotation possible in terms of angle calibration, steadiness and consequent absence of torque between both sides of device.

- 5 Place a locking washer and then a flat washer onto each knob. Tighten the SC6000 Controller to its bracket by screwing the knobs into their holes – one on each side.

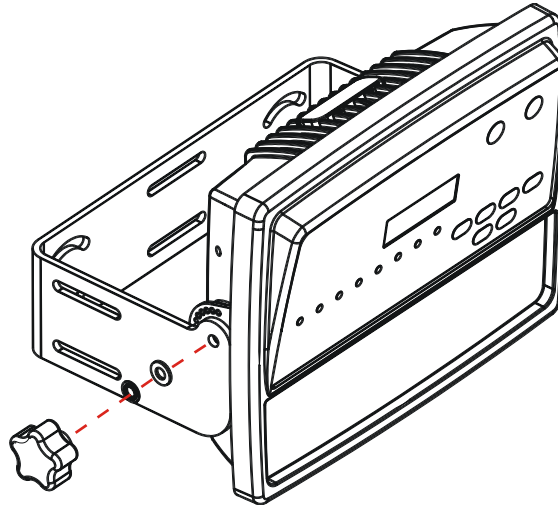


Figure 7 – Mounting the SC6000 Controller on the bracket

The SC6000 Controller can rotate on its mounting bracket up to 90° with respect to the mounting bracket position. See figure below for suggested positions:

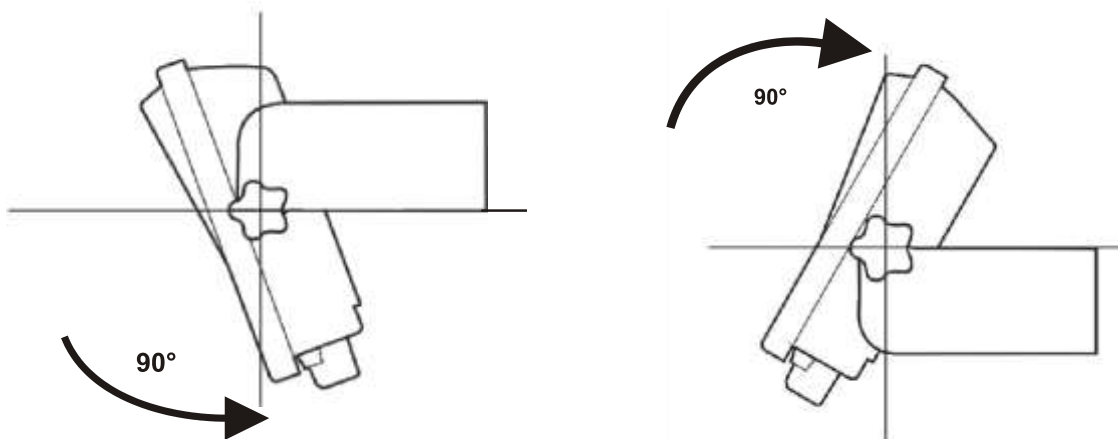


Figure 8 – Suggested Mounting Positions

2.4 ELECTRICAL CONNECTIONS

The connectors available for each scanner model are the following:

Scanner Model	Connector	Type
All models	Power/Net	25-pin male power supply, lonworks and input/output signals; see Appendix A
	Extended I/O	25-pin female extended I/O signals (optoisolated); see Appendix A
	Main	9-pin female RS232/RS485 main serial connection
	Aux	9-pin female RS232 auxiliary connection
	Modem	9-pin male modem connection
	Eth-1	RJ45 modular Ethernet network
- 1230	Eth-2	RJ45 modular Ethernet network
- 1211	Profibus	9-pin female Profibus network
- 1215	DeviceNet	5-pin male DeviceNet network

2.4.1 Main Interface

The main serial interface is compatible with the following electrical standards:

RS232

RS485 full-duplex



CAUTION

Do not connect GND and GND_ISO to different (external) ground references. GND and GND_ISO are internally connected through filtering circuitry which can be permanently damaged if subjected to voltage drops over 0.8 Vdc.

Details regarding the connections and use of the main interface selection are given in the next paragraphs.

9-pin D-sub Female Connector Pinout			
Pin	RS232	RS485 Full Duplex	<p>9-pin D-sub Female Connector</p>
2	TX	TX485 +	
3	RX	RX485 +	
5	GND_ISO	GND_ISO	
7	CTS	RX485 -	
8	RTS	TX485 -	

RS232 Interface

The main serial interface is used for communication with the Host computer and allows both transmission of code data and controller configuration. The connections to the Host can be made as follows:

- through the PWO (in which case a CAB-SC6103 cable connects the PWO to the SC6000)
- directly to the SC6000

See also par. 2.5.1.

It is always advisable to use shielded cables. The overall maximum cable length must be less than 15 m (49.2 ft).

The following pins of the 9-pin connector are used for RS232 interface connection:

Pin	Name	Function
2	TX	Transmit
3	RX	Receive
5	GND_ISO	Main signal ground
7	CTS	Clear to send
8	RTS	Request to send

The RTS and CTS signals control data transmission and synchronize the connected devices. If the RTS/CTS hardware protocol is enabled, the SC6000 activates the RTS output to indicate a message can be transmitted. The Host must activate the CTS input to enable the transmission.

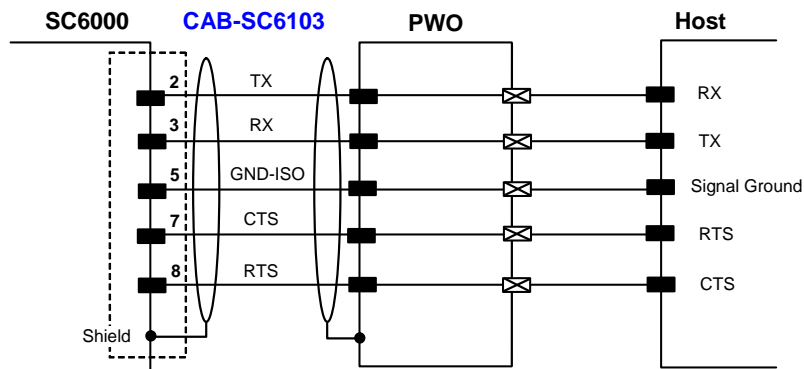


Figure 9 - RS232 Connections: Host - PWO- SC6000

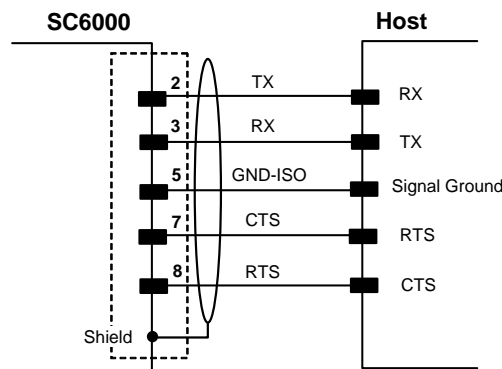


Figure 10 - RS232 Connections: Host - SC6000

RS485 Full-Duplex Interface

The RS485 full-duplex interface is used for non-pollled communication protocols in point-to-point connections over longer distances (max 1200 m / 3940 ft) than those acceptable for RS232 communications or in electrically noisy environments. The connections to the Host can be made as follows:

- through the PWO (in which case a CAB-SC6103 cable connects the PWO to the SC6000)
- directly to the SC6000

See also par. 2.5.1.

The following pins of the 9-pin connector are used for RS485 full-duplex interface connection:

Pin	Name	Function
2	TX485 +	RS485 output (+)
3	RX485 +	RS485 input (+)
5	GND-ISO	Main signal ground
7	RX485 -	RS485 input (-)
8	TX485 -	RS485 output (-)

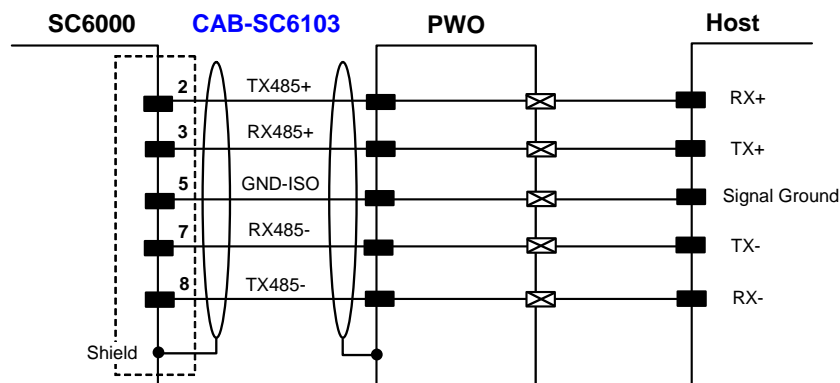


Figure 11 - RS485 Full-Duplex Interface Connections: Host - PWO - SC6000

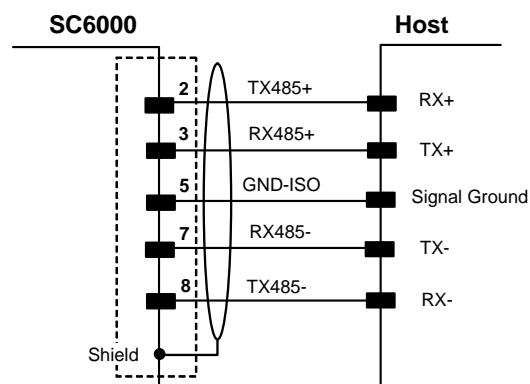



Figure 12 - RS485 Full-Duplex Interface Connections: Host - SC6000

 **NOTE** For applications that do not use RX485 signals, do not leave these lines floating but connect them to GND-ISO as shown below.

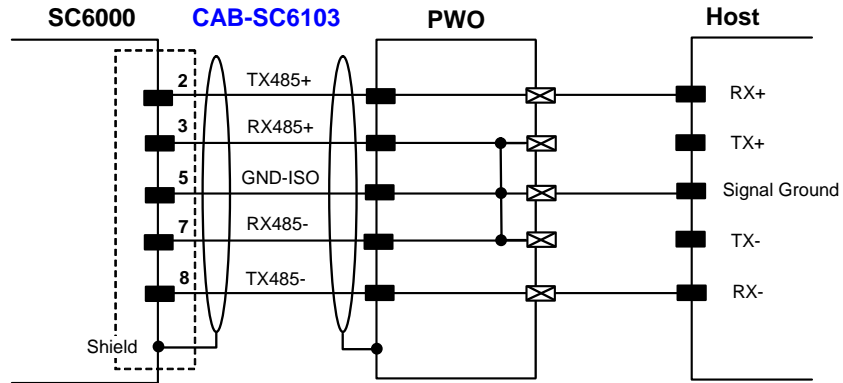


Figure 13 - RS485 Full-Duplex Interface Connections Using Only TX Signals

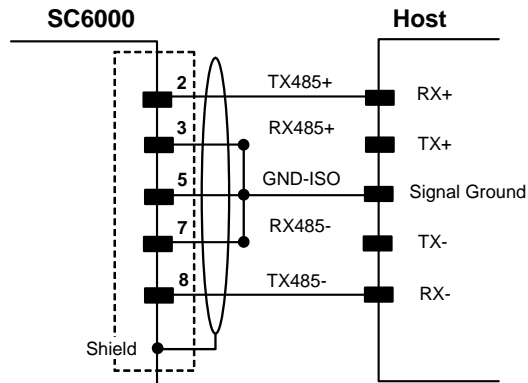


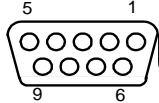
Figure 14 - RS485 Full-Duplex Interface Connections Using Only TX Signals: Host - SC6000

2.4.2 Auxiliary Interface

The auxiliary serial interface is equipped with RS232 interface connections. The interface can be enabled or disabled through the Genius™ configuration program.

The following pins of the 9-pin connector are used for RS232 interface connection:

9-pin D-sub Female Connector Pinout		
Pin	Name	Function
2	TX	Transmit
3	RX	Receive
5	GND	Ground



9-pin D-sub Female Connector

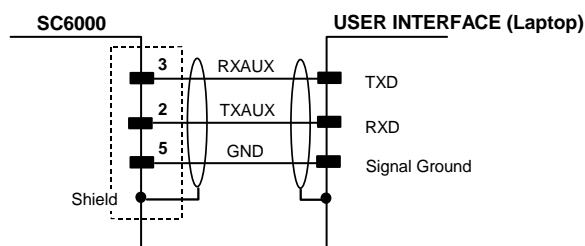


Figure 15 – RS232 Auxiliary Interface Connections

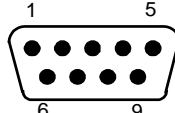
2.4.3 Modem Interface

SC6000 offers a dedicated 9-pin port for a Modem connection. The modem connection allows a Host to remotely control the reading station. The connections to modem can be made as follows:

- through the PWO (in which case the modem is installed internally to the PWO and a CAB-SC6103 cable connects the modem from the PWO to the SC6000)
- directly to the SC6000

See also par. 2.5.1.

9-pin D-sub Male Connector Pinout		
Pin	Name	Function
1	CD	Carrier detect
2	RX	Receive
3	TX	Transmit
4	DTR	Data terminal ready
5	GND	Ground
6	DSR	Data set ready
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring indicator



9-pin D-sub Male Connector

2.4.4 Ethernet Interface

This connector is available for all SC6000 Controller models and allows the Ethernet connection to the host.

In the SC6000-1230 Dual Ethernet there are two Ethernet connectors for secondary host connections.



Figure 16 – SC6000 Harting RJ Industrial® Female Connector


 NOTE	<p><i>For Ethernet connections, always use the Harting RJ Industrial® Push Pull Ethernet connector (included in the package). This connector assures a robust connection and full IP rated protection.</i></p>
--	--



Figure 17 – Harting RJ Industrial® Push Pull Male Connector

This interface and the connector pinout (see the following table) are IEEE 802.3 10 BaseT and IEEE 802.3u 100 BaseTx compliant.

RJ45 Modular Jack Pinout		
Pin	Name	Function
1	TX +	Transmitted data (+)
2	TX -	Transmitted data (-)
3	RX +	Received data (+)
6	RX -	Received data (-)
4, 5, 7, 8	N.C.	Not connected

The Ethernet interface (NIC) can be used for TCP/IP communication with a remote or local host computer by connecting the SC6000 Controller to a LAN or directly to a host PC.

The following is an example of a connection to a LAN through a Hub using a straight through cable:

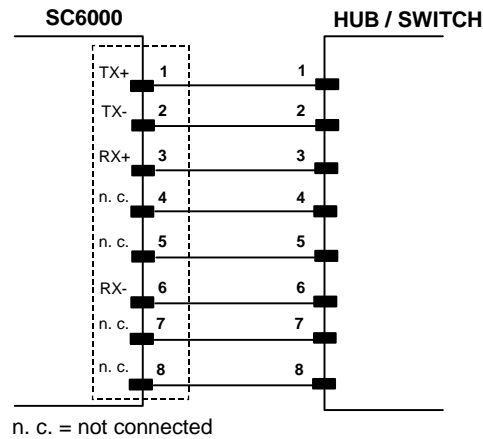


Figure 18 – Straight Through Cable

The following is an example of direct connection to a PC using an inverted cable:

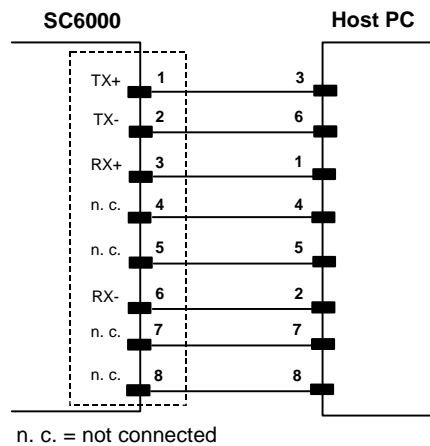


Figure 19 – Inverted Cable

For further details refer to the “Ethernet Service Guide” document provided as reference documentation.

2.4.5 DeviceNet Interface

The 5-pin male connector is only available in the SC6000-1215 DeviceNet model and allows connection between the host and the controller:

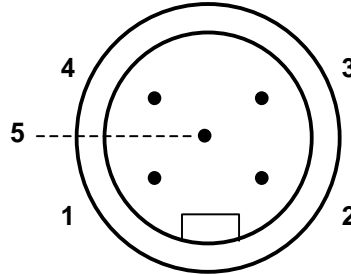



Figure 20 – DeviceNet 5-pin Male Connector

5-pin DeviceNet connector pinout		
Pin	Name	Function
2	V +	Supply voltage – positive pin
5	CAN_L	CAN bus data line – L
1	SHIELD	Shield
4	CAN_H	CAN bus data line – H
3	V -	Supply voltage – negative pin

 **NOTE** *The power supplied on pin V+ and V- is used only to propagate power to the section of the DeviceNet board directly connected to the Bus. It is completely isolated from the SC6000 power, which must be supplied on pin 16 and pin 3, 4 of the 25-pin Power/Net connector.*

2.4.6 Profibus Interface

The 9-pin female Profibus connector (white) is only available in the SC6000-1211 Profibus model and allows connection between the host and the controller:

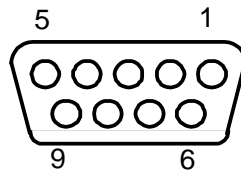


Figure 21 – Profibus 9-pin Female Connector

9-pin D-sub Female Profibus connector pinout		
Pin	Name	Function
1	Shield*	Shield, protective ground resp.
2	N.C.	Not connected
3	B-LINE (RxD/TxD-P)	Received/Transmitted data-P
4	CNTR-P**	Repeater control signal
5	DGND	Data ground (M5V)
6	+5 V	Voltage plus (P5V)
7	N.C.	Not connected
8	A-LINE (RxD/TxD-N)	Received/Transmitted data
9	CNTR-N**	Repeater control signal

- signal is optional

** signal is optional; RS485 level

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

For further details refer to the “Profibus_Fam6k.pdf” document provided as supplementary documentation.

2.5 TYPICAL LAYOUTS

The following typical layouts refer to system hardware configurations, but also require the correct setup of the software configuration parameters (see par. 3.2 for details).

Other layouts require the use of a specific SC6000 Controller model.

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

2.5.1 Large Synchronized Network Layout

When building a large local Lonworks network (more than 10 scanners), an SC6000 Controller must be used together with a PWO power supply/junction box unit. In this case the SC6000 unit acts as the system master and is connected to the host through one of its interfaces.

All scanners act as slaves and are connected to the SC6000 through the PWO power supply/junction box. For DS8100A/DX8200A scanners, 4 branch connectors provide Lonworks communications between the scanners and the SC6000 unit. The last scanner on the line requires a Termination connector as well as any unused branches in the PWO unit.

The allowed maximum bus length is 65 m.

External devices such as a presence sensor and an encoder are all connected to the PWO.

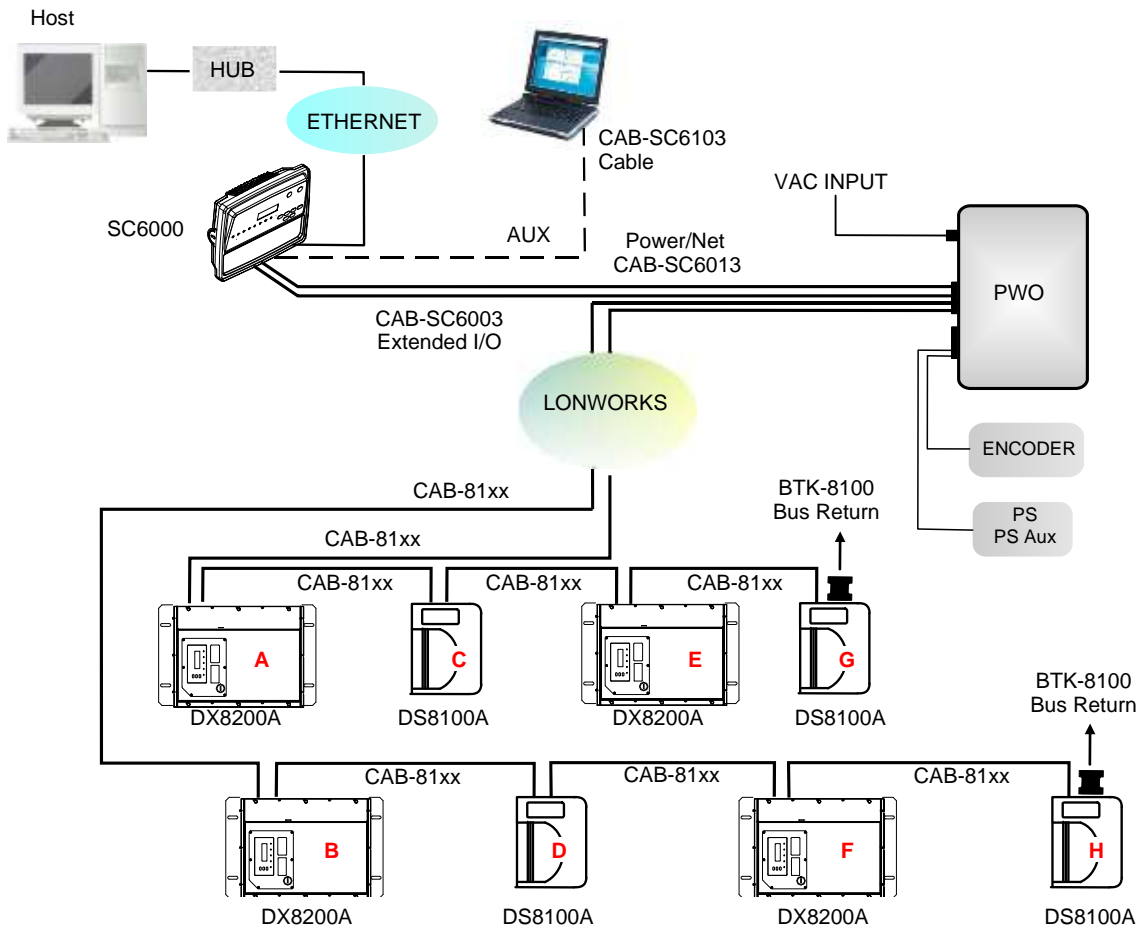


Figure 22 – Large Synchronized Network with DX8200A and DS8100A Scanners

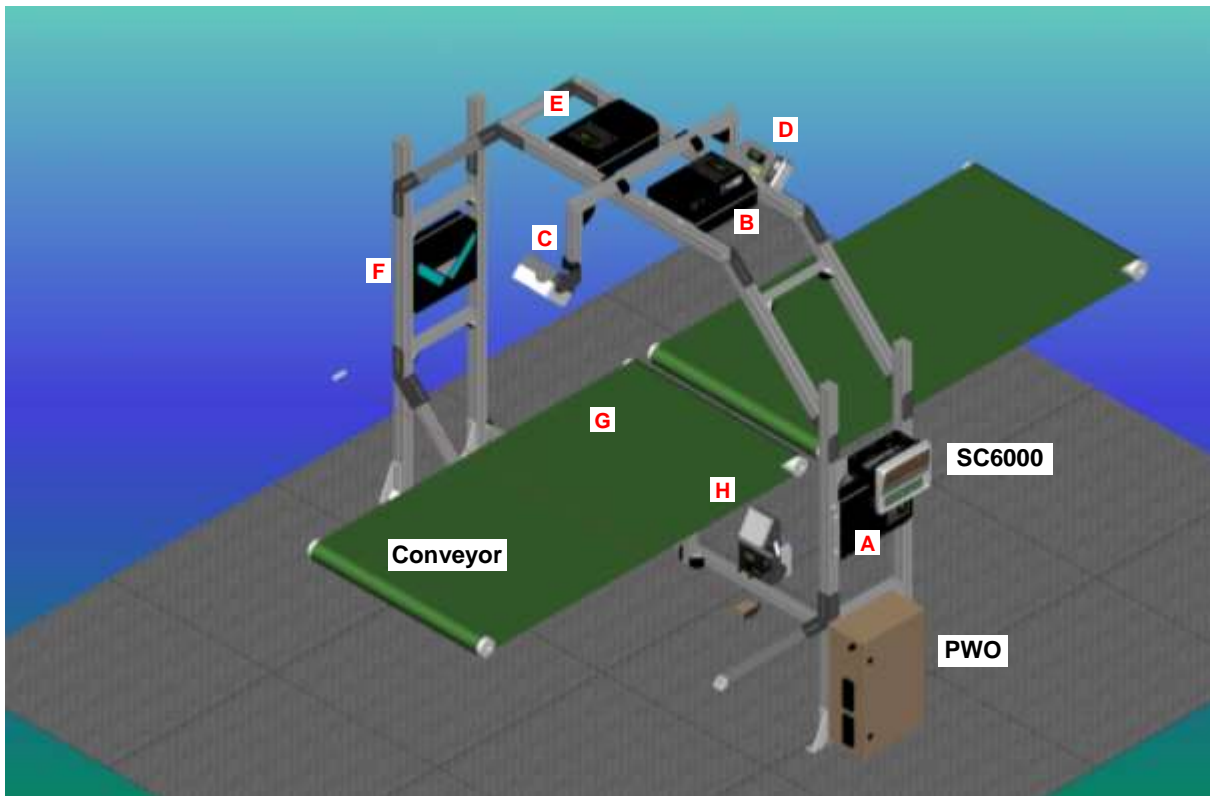
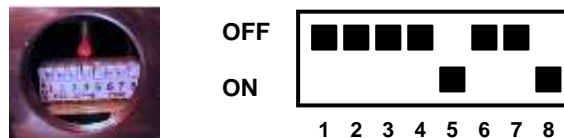


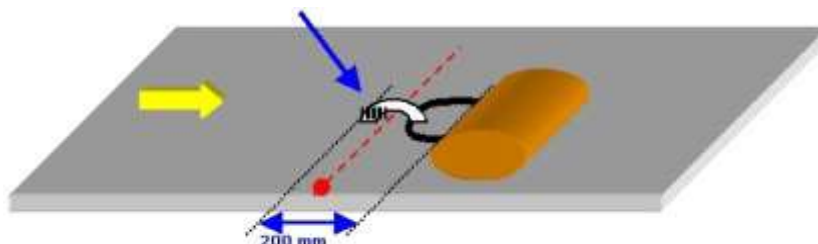
Figure 23 – Example Large Synchronized Network Reading Station

Here are a few helpful hints which can improve station performance and reduce installation time:

1. Scanner distribution should alternate between odd and even branches so that the station guarantees 50% reading on all sides. See also Figure 22.
2. For OEK Encoders set the parameter Operating Mode>Encoder Step = 252.



3. For Top Front and Top Back scanners (C and D in Figure 23), set the parameter Reading Parameters>Reading Condition = Skew 45°.
4. For applications having regular shaped packs the default settings are sufficient, but for Airport applications, irregular shaped packs can cause PS signal glitches resulting in false "packs too short" or "packs too close" errors.



To correct this, set the following Operating Modes parameters: Minimum Distance Between Packs = 200 mm, Minimum Pack Length = 200 mm, Window Dimension = 200 mm.

2.5.2 Redundant System Layout

For large local Lonworks networks, a redundant system can be configured in which two SC6000 Controllers are used together with their respective PWO power supply/junction box units. The scanners are distributed equally between the PWO units. In this case one of the SC6000 Controllers is dedicated as the working or active unit while the other functions as a dedicated protecting or backup unit.

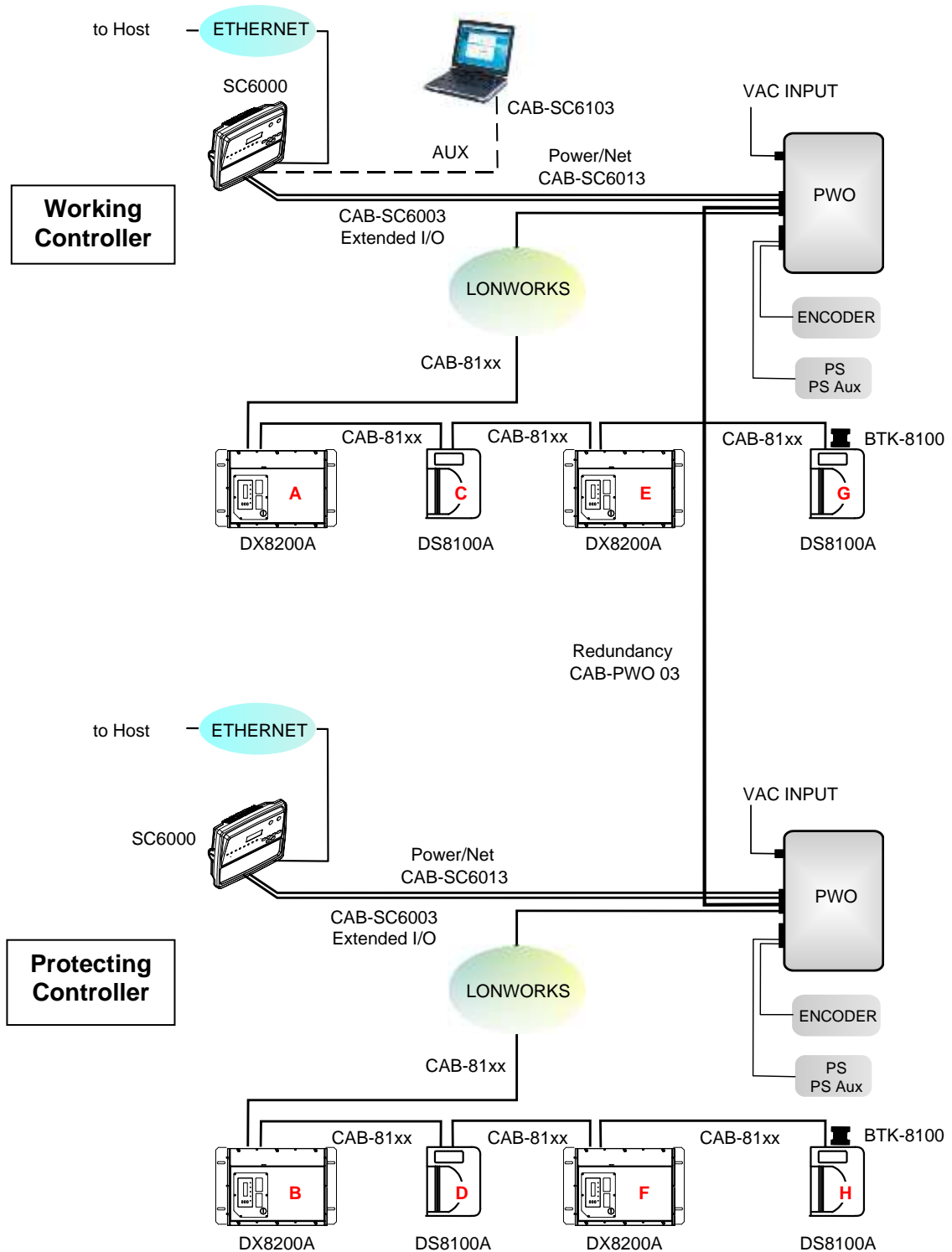


Figure 24 - Redundant Reading Station Layout with DX8200A and DS8100A Scanners

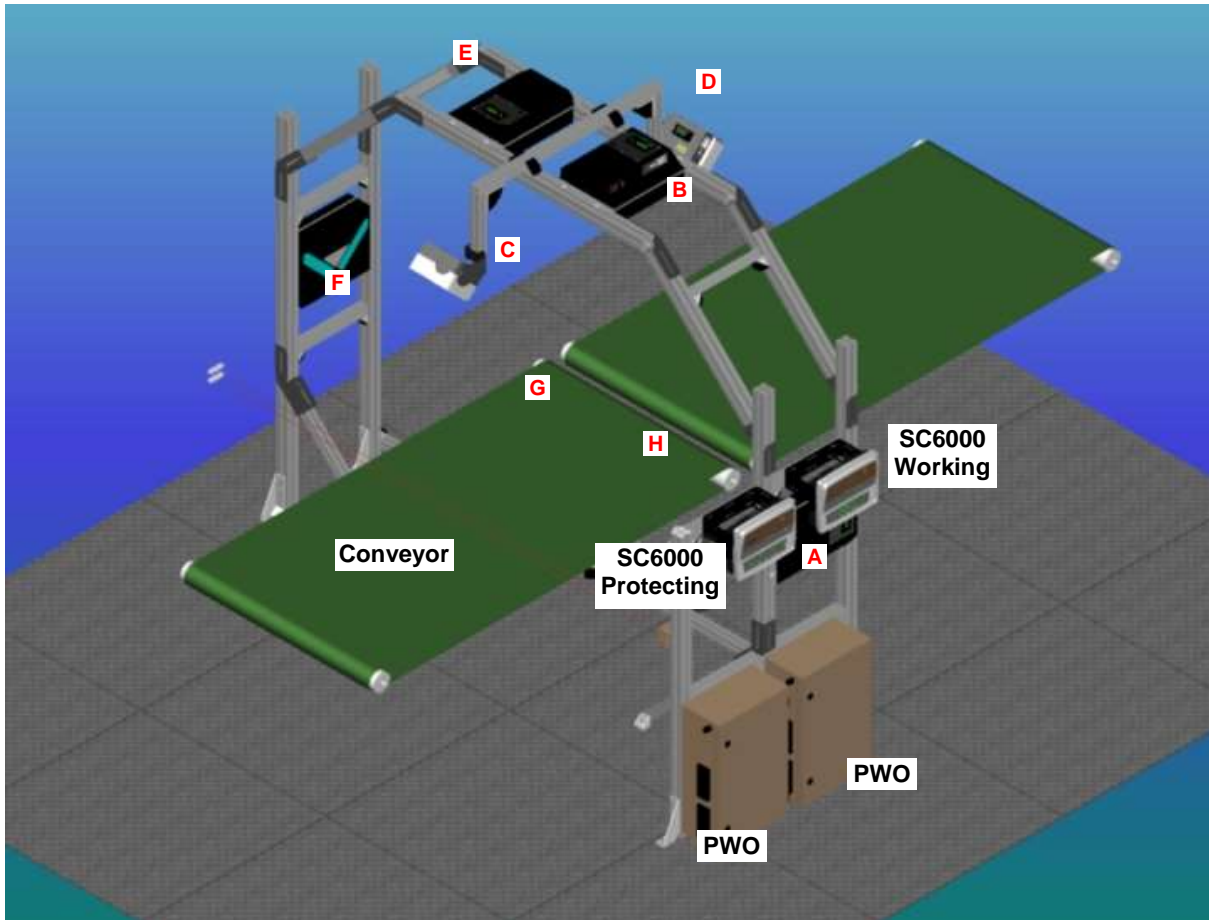


Figure 25 – Example Redundant Reading Station

2.5.3 Standard SC6000 to Host Layout

The SC6000 can be connected to the Host in several different layouts:

- Ethernet direct or through Hub;
- point-to-point on the Main interface using either RS232 or RS485 full-duplex communications to Host;
- directly to a modem for remote Host communications.

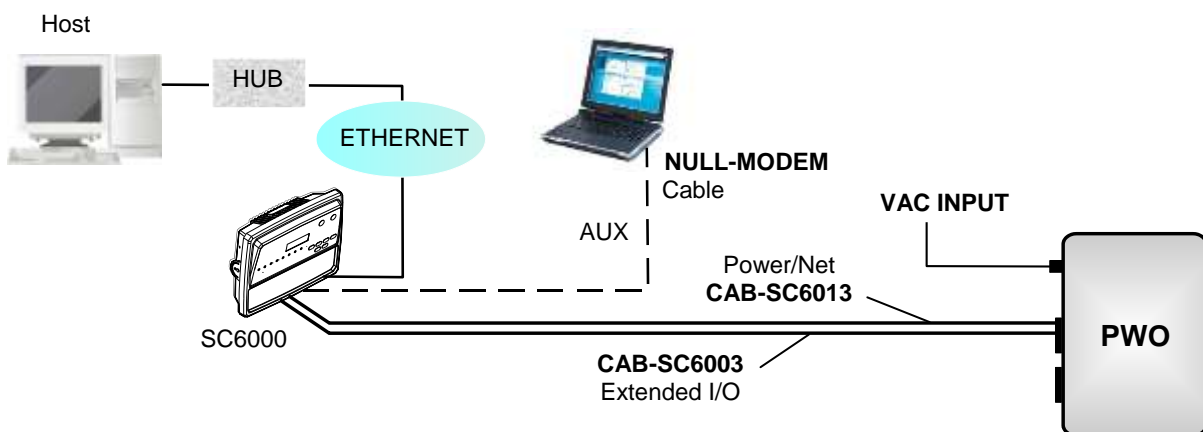


Figure 26 – Ethernet Connection

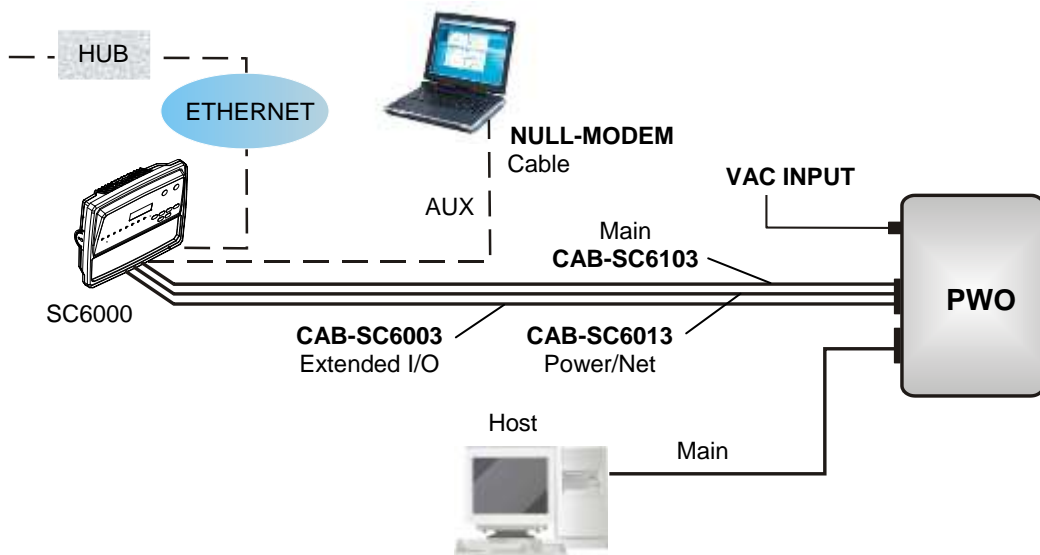


Figure 27 – Main Connection through PWO

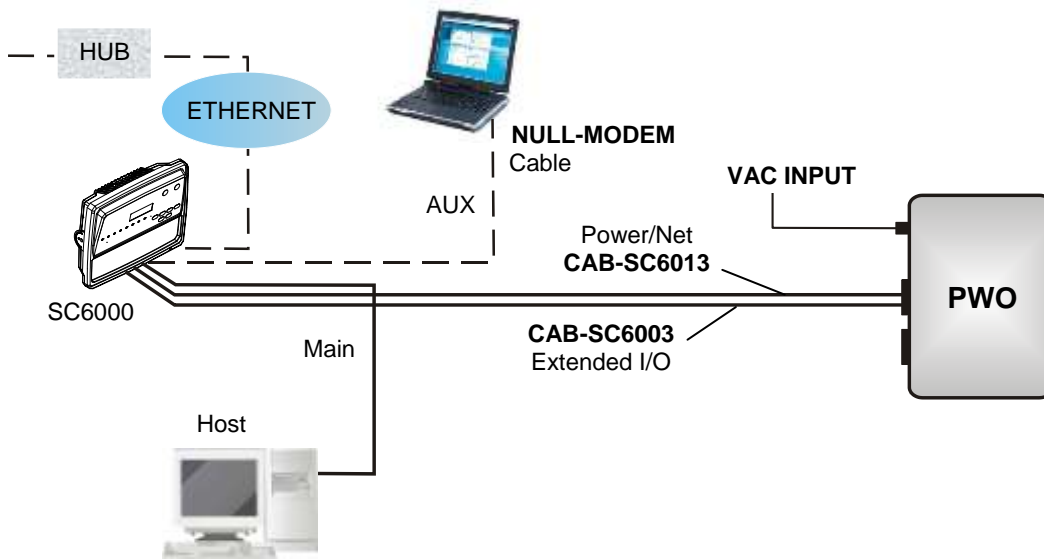


Figure 28 – Main Connection directly to SC6000

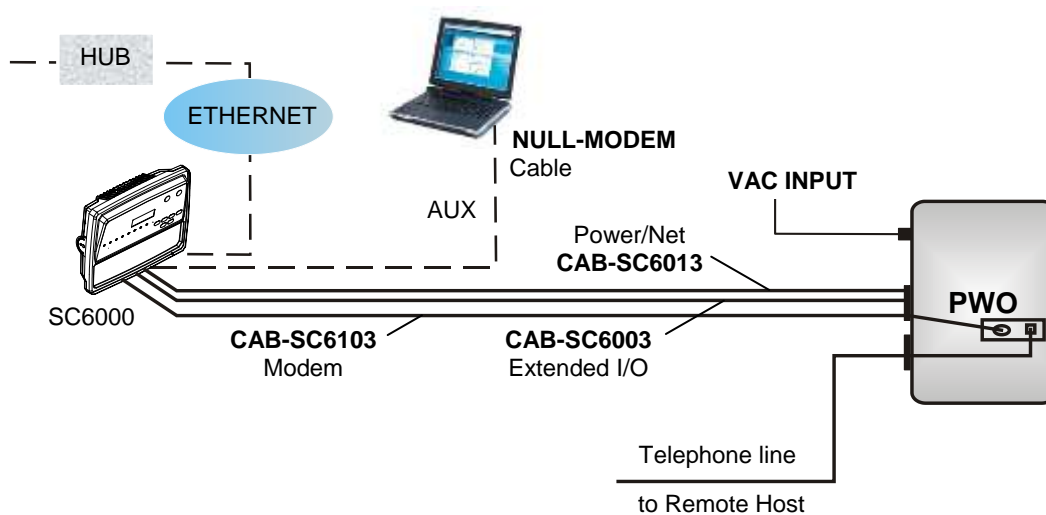


Figure 29 – Modem Connection through PWO

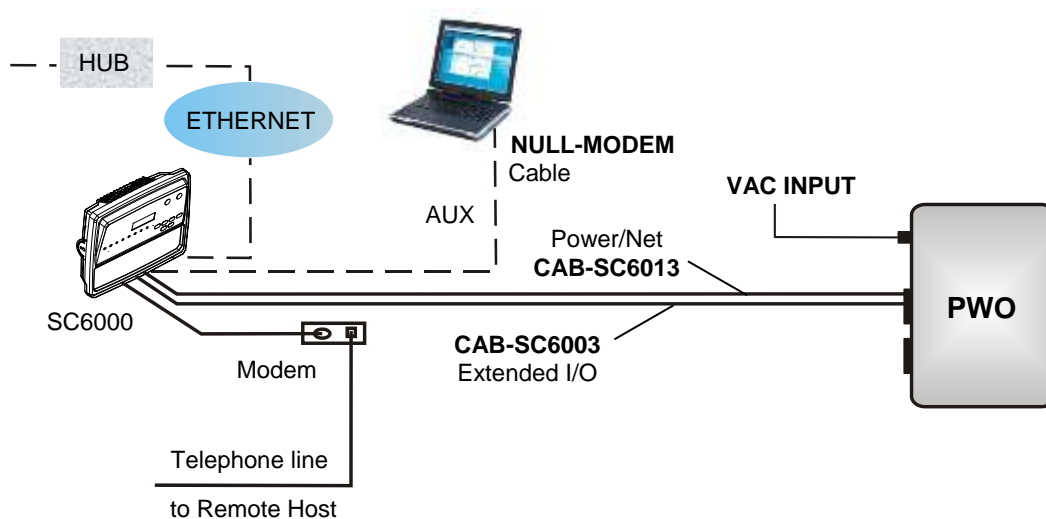


Figure 30 – Modem Connection directly to SC6000

2.5.4 SC6000 to Fieldbus Network Layout

The SC6000 can be connected to a Fieldbus network (Ethernet, DeviceNet, or Profibus) to communicate with a remote host (for example, remote PC connected via Internet). Connections are made directly through cables to the Fieldbus connector and do not require any converter or adapter.

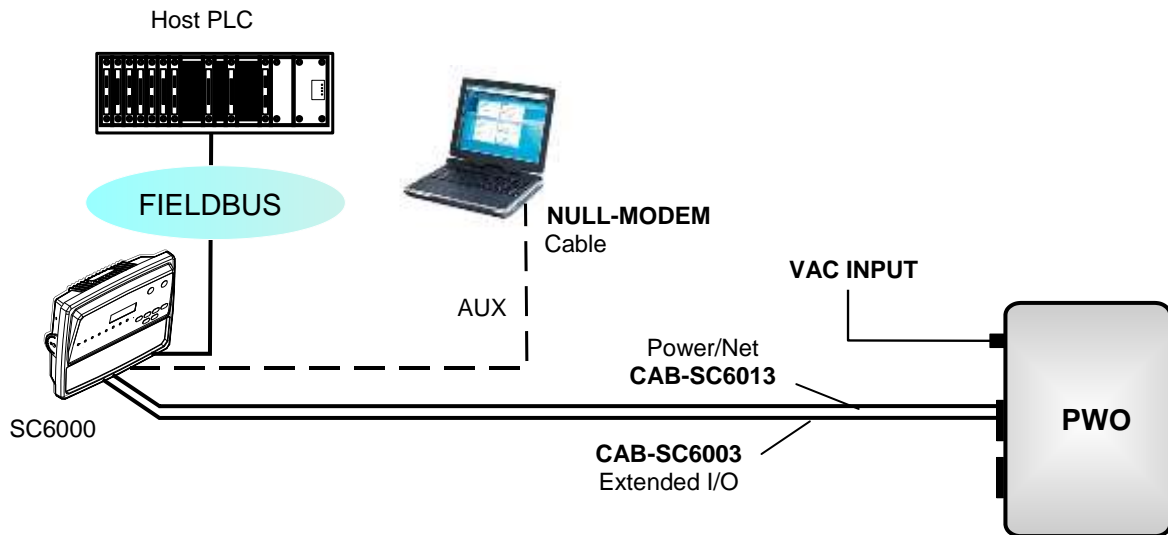


Figure 31 – Fieldbus Network

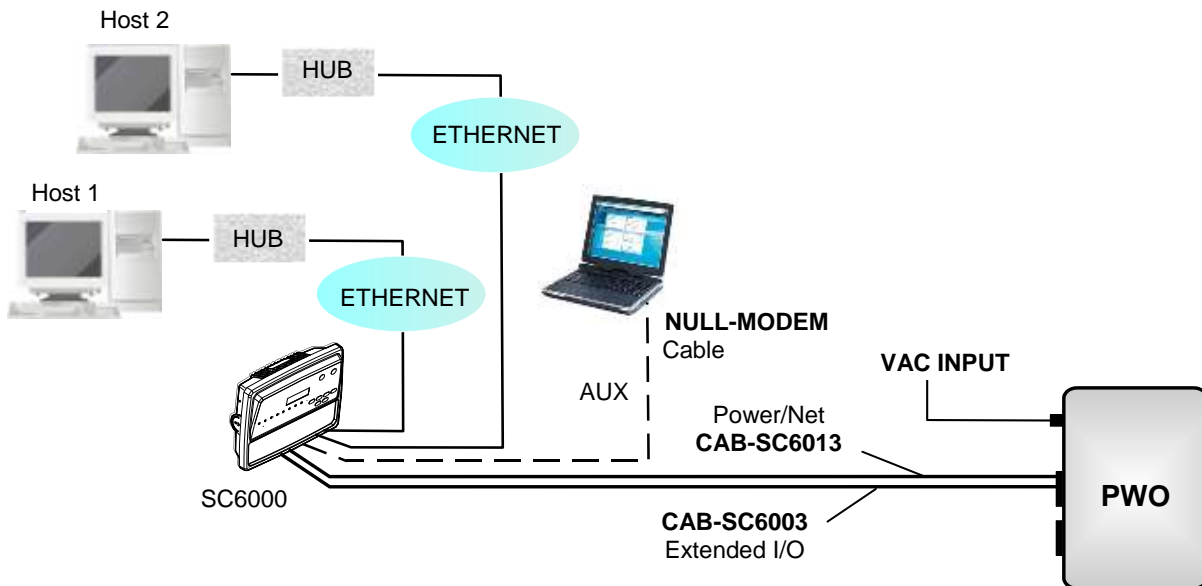


Figure 32 – Dual Ethernet Connection

2.6 KEYPAD AND DISPLAY

The SC6000 display shows different messages according to the following operating modes. Use the SC6000 keypad to scroll through the windows or navigate in the menu.

2.6.1 Standard Mode

Upon startup, the Diagnostic Mask window is visualized by default. Using the **UP** and **DOWN** arrow keys it is possible to scroll through the following windows:

- 1) Diagnostic Mask Window
- 2) Reading Performance Window
- 3) Reading Mask Window
- 4) I/O Status Window
- 5) Conveyor Speed
- 6) System Info Window
- 7) Last Code & Read Mask
- 8) Alarms

Diagnostic Mask Window (Default Window)

This window illustrates the status of each node (of each scanner of the cluster).

```

S c a n      * * * * *
S t a t e    A B C D E F G H
  
```

The slave scanners are listed as letters (**A**, **B**, **C**, etc.) [or numbers (**01**, **02**, **03**, etc.) depending on the *System Information Section>User Interface Style* configuration parameter in Genius].

Above each scanner position a symbol indicates the scanner status according to the following convention:

- From the startup the node NID has not been discovered.
- ? At the startup of the system the NID has been discovered but the node does not answer to the master.
- * The node status is OK.
- ! The node returns an error code to the diagnostic Laser Off.
- & The node returns an error code to the diagnostic Motor Off.
- % The node is in monitor mode.

Other messages can also be displayed:

“Empty scan cluster“	No scanner has been discovered within the cluster.
“No slave expected“	A scanner not expected by the system configuration has been discovered.
“Energy Saving“	The Energy Saving feature has been activated. (see Genius™ program Help On-Line)

Reading Performance Window

This window displays the following data:

```

P a c k      o u t      =      1 2 4 6 7
G o o d      r e a d      =      1 2 4 6 7
N o          r e a d      =      0
M u l t i p l e      r e a d      =      0
  
```

- Number of processed parcels
- Number of Good Reads
- Number of No Reads
- Number of Multiple Reads

Reading Mask Window

This window indicates the node that performed a reading of the codes enabled on the master.

```

R e a d      *      *
m a s k      A B C D E F G H
  
```

The following indicators are used:

- * The node read a barcode enabled on the master.
- <space> The node read no barcode.

I/O Status Window

This window provides data concerning the digital input/output status.

```

E N C = 0      P S = 0      P S A U X = 0
I N 1 = 1      I N 2 = 0      I N 3 = 0
O U T 1 = 0      O U T 2 = 0      O U T 3 = 0
O U T 4 = 0      O U T 5 = 0      O U T 6 = 0
  
```

0 = Low Level Signal
1 = High Level Signal

Conveyor Speed Window

This window provides data concerning the conveyor speed.

```

C o n v e y o r      s p e e d
x x      ( m m / s e c )
x x      ( f t / m i n )
  
```

System Info Window

This window provides information about the software release.

```
S C 6 0 0 0      6 K   M a s t e r
R e l   A P L _ S T D _ 1 . 0 1
A d d r      1 7 2 . 0 1 6 . 0 1 1 . x x x
```

For Dual Ethernet models the additional Ethernet address is also displayed.

Last Code & Read Mask

This window is available only when enabling the *Last Code & Reading Mask Window* parameter in Genius. It displays the following data fields

```
L a s t C o d e      &   R e a d M a s k
>   2 5 6 3 4 8 9 3 3 2 5 7 5 3 2 4 5 7
> A D
G 1 0 0 %      N 0 %      M 0 %      P 0 %
```

- Last read code (shown truncated if longer than 18 digits)
- List of nodes that performed the reading
- Statistics (Good Read Rate, No Read Rate, Multiple Read Rate, Partial Read Rate) calculated on the last 100 codes or in continuous mode depending on the *Last Code & Reading Mask Window* parameter selection.

Alarms

Specific diagnostic alarms are available only when they are enabled through the Genius™ configuration program.

```
N o      a l a r m s
```

Up to four alarms can be displayed at a time (one per line). They are generated by the network or by the SC6000. For a list of alarms and their meaning see the *Diagnostic Error Conditions* page in the Help On-Line.

All alarms are ordered according to their priority (failure messages have priority over warning messages).

A failure message causes the [Warning LED](#) to light up.

If the *Display Warnings as Alarms* parameter is enabled in Genius™, a warning message causes the Warning LED to blink.

2.6.2 Redundancy Mode

When working in a redundant system, the SC6000 displays different windows according to its redundancy role (refer to the SC6000 Help On-Line for further details).

SC6000 Active Controller Window

The SC6000 working as active controller displays the diagnostic mask window, as if it is working in a single master network.

SC6000 Standby Controller Window

This window is displayed on the SC6000 working as standby controller. It illustrates the topology redundancy role of the controller:

- “Protecting/Standby” or “Working/Standby”

2.6.3 Menu Mode

For security purposes, the menu mode is entered by pressing the **Enter** and **Menu** keys at the same time. To navigate in the menus the keypad keys are used as follows:

Press **Enter** to select an item or enter a branch level.

Press **Clear** to exit an item without saving or return to the previous branch level.

Press the **Up** or **Down** arrow keys to scroll through a branch list.

It is possible to access the **System** menu, **Setup** parameters menu or the **PackTrack** menu:

Menu	Branch	Branch	Note	
System				
	Info		Shows the System Info Window	
	Reset		Reset the system (asks for confirmation)	
	Restore			DARP Restore procedure
		Complete		Restore system configuration
		All Slaves		Restore only all slaves configuration
		Controller		Restore only SC6000 configuration
	Slave ...		Restore single specific slave configuration	
	Backup			DARP Backup procedure
		Complete		Backup system configuration
		All Slaves		Backup only all slaves configuration
		Controller		Backup only SC6000 configuration
		Slave ...		Backup single specific slave configuration
	Last Codes ¹		Shows the last 10 codes read: Up or Down to scroll through the list; one code per display screen	

The Backup and Restore procedures can also be performed in Genius™, (see chapter 4 for details).

¹ This option is available only when the *Show Last Code Window* parameter is enabled from Genius™.

Menu	Branch	Branch	Note	
Setup				
	Time		Set system time: Up & Down to change values, Enter to change fields, at last field Enter exits saving new values	
	Date		Set system date: Up & Down to change values, Enter to change fields, at last field Enter exits saving new values	
	Ethernet			Primary Ethernet interface
		IP addr		Set IP Address
		GW addr		Set Gateway Address
		Net mask		Set Netmask
		MAC addr		(it is advised not to change this value)
	DeviceNet addr		DeviceNet node address (only DeviceNet models)	
	Profibus addr		Profibus node address (only Profibus models)	
	Add. Ethernet			supplementary Ethernet interface (only Dual Ethernet models)
		IP addr		IP Address
		GW addr		Gateway Address
		Net mask		Netmask
		MAC addr		(it is advised not to change this value)
	CFlash			
		Format		Format the Compact Flash Disk
		Format&Rep		Format and repair corrupted CF
		Del Logs		Del log files (SC8000 compatibility)
		Info		Shows CF capacity, free and used space
	Lonworks			
		Autoset		Performs the Net-Autoset procedure: assigns random addresses to all slave nodes
		Stat.		Prints Lonworks network statistics (not data), to the enabled serial port
	Statistics	Reset Statistics		Resets Statistical Counters

The Address parameters may be set through Genius™, (see chapter 3 for details).

For software versions earlier than 4.20, Statistical Counters can be reset by pressing the Setup Key.

Menu	Branch	Default	Note
PackTrack			Automatic PackTrack Calibration procedure for the Reading Station working in PackTrack or Continuous Operating Modes
	Version	2	Select the version number of the PCT-8000 pack
	Cal Type	XYZ	XYZ calibration is forced.
	X Cal	Absolute	Absolute X position is forced.
	X Offset	-	Set the zero point of the X-axis (4 digits in mm)
	Sensor	0	Set the distance (3 digits in mm) between the photocells in the photocell array. If the system Presence Sensor and Encoder are used, set this parameter to 0.
	Start		Start the Auto PackTrack procedure
	Z Offset	0	Set a correction factor for the pack height (3 digits in mm)

The Auto PackTrack procedure when run from the SC6000 keypad, requires a system reset before the calibration is recognized. See the Auto PackTrack Setup procedure in par. 2.7.3. The Auto PackTrack setup may be performed in Genius™. For more details see the Help On-Line.

2.7 AUTO PACKTRACK™ CALIBRATION FOR READING STATION USING SC6000 MENU

2.7.1 Auto PackTrack Conditions and Limits

The Conditions and Limits for Auto PackTrack Calibration are summarized here for convenience and are also integrated into the following procedure descriptions:

- The following scanners are supported by Auto PackTrack Calibration: DS6400 (*see note below), DX6400 (*see note below), DS8100A, DX8200A
- Before performing the Auto PackTrack Calibration procedure, if a system reset or power reset is performed, wait for all the scanners to be available (up to 60 sec.) before proceeding.
- Operating Mode must be either PackTrack or Continuous
- If the system Presence Sensor and Encoder are used, the correct Encoder Step value must be set and the Presence Sensor must be connected to the SC6000 PS input.
- If instead the PPA-8000 Photocell Array is used, it must be connected to the SC6000 PS and PSAUX inputs, **and the Encoder, if present, must be physically disconnected.**
- DX scanners which are calibrated automatically cannot be automatically replaced by DX scanners with a previous sw version (earlier than 6.80). You must either update the old scanner software prior to substitution, or complete the calibration manually, after installation, by setting the PSoffset and Direction parameters.

**NOTE**

The autofocus feature of DS6400 and DX6400 scanners makes Auto PackTrack Calibration difficult, therefore to assure that the procedure can correctly calibrate these scanners, it is necessary to set a fixed focus value which allows the scanner to read all the label positions useful for its calibration.

2.7.2 Auto PackTrack Parameter Descriptions

The following descriptions refer to the **PackTrack** menu in par. 2.6.3.

Version: the version of the PCT-8000 being used for calibration. This value can be read from the barcode labels on the PCT-8000. Each label has the value *vnnn* where *v* is the version number.

Cal Type: the XYZ calibration is forced. The coordinates for the three axes are calibrated.

**NOTE**

For Oscillating Mirror scanner models the scan line must be parallel to the conveyor direction and only the Y calibration will be performed, (the X and Z axes will automatically be set to zero).

X Cal: the Absolute X position is forced. The X coordinate for all scanners is relative to the precise point (PackTrack Reference Point X, Y, Z = 0).

X Offset: The X Offset moves the Absolute X coordinate (X, Y, Z= 0) for all the scanners to the desired point along the X axis which will be measured in step 7 in par. 2.7.3.

Sensor: calibration will be performed either using the system Presence Sensor and Encoder (most cases), or the PPA-8000 Photocell Array, for systems where the Presence Sensor or Encoder are not present (typically Tilt-Tray or Cross-Belt applications).

**NOTE**

*The Auto PackTrack procedure **requires** using the PPA-8000 Photocell Array for all systems where either the Presence Sensor or the Encoder are absent (including Continuous Operating Mode and Cargoscan applications).*

If using the Presence Sensor and Encoder, the presence sensor must be connected to the SC6000 PS input and in this menu the parameter is set to **0**. The Encoder Step parameter must also be set correctly.

If using the PPA-8000 you must set the Photocell distance (**165 mm**). The Photocell Array must be connected to the SC6000 PS and PSAUX inputs (see the relative installation manual), **and the Encoder, if present, must be disconnected.**

Z Offset (if necessary): for packs that are elevated above the conveyor surface (for example on tilt trays), this parameter sets an offset for the height of a pack so that Z=0 corresponds to the bottom of the pack.

2.7.3 Auto PackTrack Setup

After setting the initial parameters in the PackTrack menu the Auto PackTrack setup procedure can be started:

1. Press **Enter** at the *Start* item in the *PackTrack* menu.
2. Press **Enter** to confirm the action. The SC6000 sends the message to the Slave scanners and the Display shows the *Wait* message.

After receiving the answer from all of the Slaves, the SC6000 shows the status of each node (of each scanner of the cluster) as in the example below.

```

S c a n      I I I U I I I I
S t a t e    A B C D E F G H

```

The slave scanners are listed as letters only (**A**, **B**, **C**, etc.) independently from the selection in the *System Information Section>User Interface Style* configuration parameter in Genius™.

Above each scanner position a symbol indicates the scanner status according to the following convention:

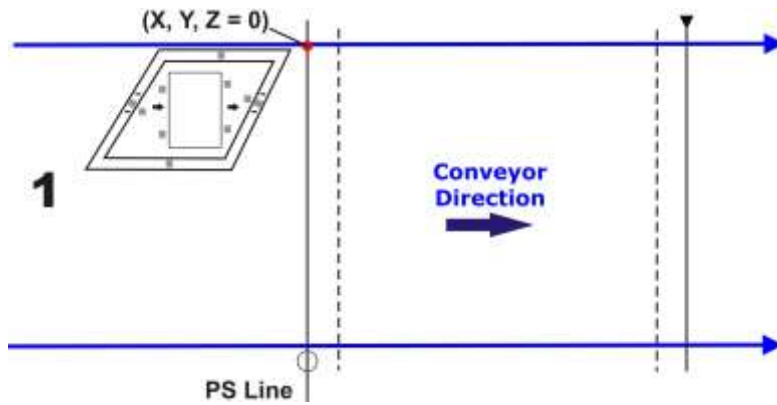
U	cannot be calibrated	not supported by scanner software version
U	can be calibrated	can be calibrated but the calibration procedure fails either barcode reading or verification
L	Lost	scanner stops responding during the procedure
I	Initial State	scanner ready to be calibrated
N	Not Verified	scanner calibrated but not verified
C	Calibrated	scanner is calibrated

3. At this point the SC6000 display allows to *Continue* or to *Stop* the procedure. You can switch between the previous display windows using the **Up** or **Down** arrow keys.

If there are any nodes that show as *U* or *L*, then you should *Stop* the procedure and correct the problem.

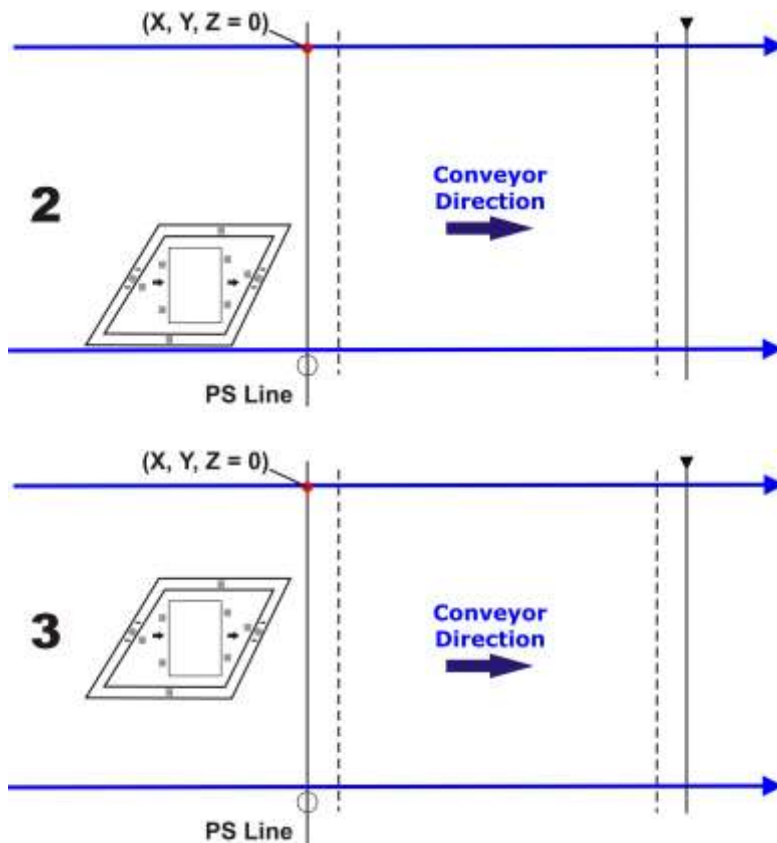
If the nodes respond with *I*, *N*, or *C* then you can *Continue* with the procedure.

4. Press **Enter** to *Continue* the procedure. The SC6000 shows message *Let the parcel run*.
5. Place the PCT-8000 onto the moving conveyor, before the PS Line (reference point) and parallel to a conveyor edge (i.e. right-hand edge) with its arrow in the same direction as the conveyor movement. Let it pass through the reading station. The SC6000 shows the *Wait* message.



After elaborating the passage of the parcel, the SC6000 again shows the status of each node (of each scanner of the cluster) and then the *Continue* or *Stop* screen.

6. Repeat steps 3 - 5 changing the PCT-8000 X position (i.e. always before the PS Line (reference point) and parallel to a conveyor edge but changing to the left-hand edge and/or to the center of the conveyor), until the procedure terminates.

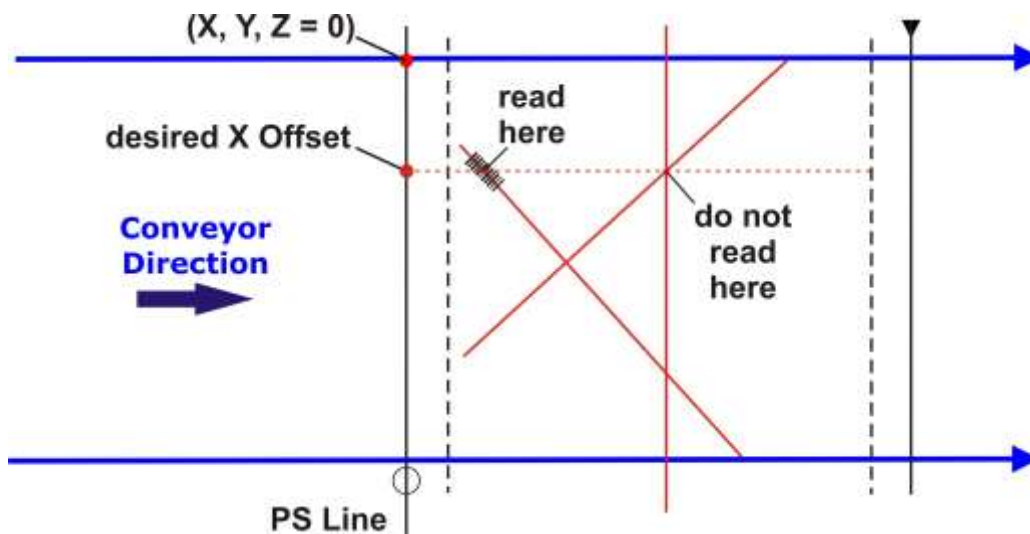


Typically 3 passes are necessary.

- At the last step in the sequence the display prompts to place a barcode label **centered** onto the physical X position (X Offset) on the conveyor and then press Enter to Continue. You have 2 minutes to read the code before the procedure ends automatically.

**NOTE**

*Be careful that the barcode is not accidentally read in the act of placing it at the desired X Offset position, and assure that **it is read by only one scanner** (see the figure below). After placing the barcode label on the X coordinate, you may have to pass your hand or other opaque object over it to end this step.*



Pressing Clear at any point will terminate the procedure without saving the Absolute X position alignment.

**NOTE**

Before resetting the SC6000, if desired, you can download the Auto PackTrack Report file from the SC6000 RAM by connecting it to Genius™ and using the Tools>File transfer... menu. See Help On-Line.

- Manually reset the SC6000.

2.7.4 Auto PackTrack Report

The Auto PackTrack Report file can be downloaded from the SC6000 RAM by using the *Tools>File transfer...* menu in Genius™. The report is divided into three sections.

The first section contains the general calibration parameters:

PARAMETERS

Calibration type	XYZ X Absolute (X Offset 550)
Sensor type	configured
Pack version	2 (Z Offset 0)

The second section contains for each node, the calibration table, and the final calibration state.

PACKTRACK GLOBAL CALIBRATION TABLE DX node 5

P1: X(mm)	36
P1: Y(mm)	1077
P1: Z(mm)	10
P1: Distance(mm)	36
P1: Position	1077
P2: X(mm)	715
P2: Y(mm)	1096
P2: Z(mm)	10
P2: Distance(mm)	10
P2: Position	715
P3: X(mm)	518
P3: Y(mm)	1304
P3: Z(mm)	650
P3: Distance(mm)	1096
P3: Position	10
XP1: X(mm)	36
XP1: Y(mm)	1077
XP1: Z(mm)	10
XP1: Distance(mm)	36
XP1: Position	1077
XP2: X(mm)	715
XP2: Y(mm)	1096
XP2: Z(mm)	10
XP2: Distance(mm)	10
XP2: Position	715
XP3: X(mm)	518
XP3: Y(mm)	1304
XP3: Z(mm)	650
XP3: Distance(mm)	1096
XP3: Position	10
Calibration State	VERIFIED

PACKTRACK CALIBRATION TABLE DS node 6

P1: X(mm)	36
P1: Y(mm)	1077
P1: Z(mm)	10
P1: Distance(mm)	36
P1: Position	1077
P2: X(mm)	715
P2: Y(mm)	1096
P2: Z(mm)	10
P2: Distance(mm)	10
P2: Position	715
P3: X(mm)	518
P3: Y(mm)	1304
P3: Z(mm)	650
P3: Distance(mm)	1096
P3: Position	10
Calibration State	VERIFIED

The last section summarizes the calibration status of each scanner.

SCANNERS STATE SUMMARY

Scanner E	Calibrated and verified
Scanner F	Calibrated and verified
Scanner J	Calibrated and verified
Scanner K	Calibrated and verified
Scanner L	Calibrated and verified
Scanner M	Calibrated and verified
Scanner N	Calibrated and verified
Scanner O	Calibrated and verified
Scanner Q	Calibrated and verified
Scanner R	Calibrated and verified
Scanner S	Calibrated and verified

2.7.5 AutoNet Setup Mode

A special Cluster Auto Setup Procedure (CASP™) allows automatic address assignment of the scanner cluster nodes. This operation can be performed by starting up the system while pressing the **SETUP** key.

Auto Setup can be performed in Genius™, see Net-Autoset in par. 3.2.1.

3 SOFTWARE CONFIGURATION

3.1 GENIUS™ INSTALLATION

Genius™ is a Datalogic scanner configuration tool providing several important advantages:

- Multi-language version;
- Defined configuration directly stored in the device;
- Communication protocol independent from the physical interface which allows the device to be considered as a remote object to be configured and monitored.

To install Genius™, proceed as follows:

- 1) Turn on the PC that will be used for configuration (Windows: NT, XP, Vista or 7);
- 2) Insert the Genius™ CD-ROM;
- 3) Wait for the CD to autorun and follow the installation procedure.

When running Genius™, the procedure for setting the parameters is supported by a help on-line, which is displayed in an HTML browser. It can be selected from the Configuration Help option available in the Help menu. In addition, a context-sensitive help can be enabled by pressing the <F1> key after selecting the desired parameter.

3.2 GUIDE TO RAPID CONFIGURATION FOR SC6000 AS SYNCHRONIZED OR MULTIDATA MASTER

This configuration is valid when the network is composed **only** of DS6000, DS8100A and/or DX8200A slave scanners.

1. Run Genius™ from the configuration PC. The following window appears asking to select the configuration mode.



Figure 33 – Genius™ Wizard Opening Window

Select Advanced. The Wizard option is not currently available for SC6000.

- From the Device Menu select Local Device Network Settings and configure your SC6000 as Master (SYNCHRONIZED is the default value), as shown in the figure below:

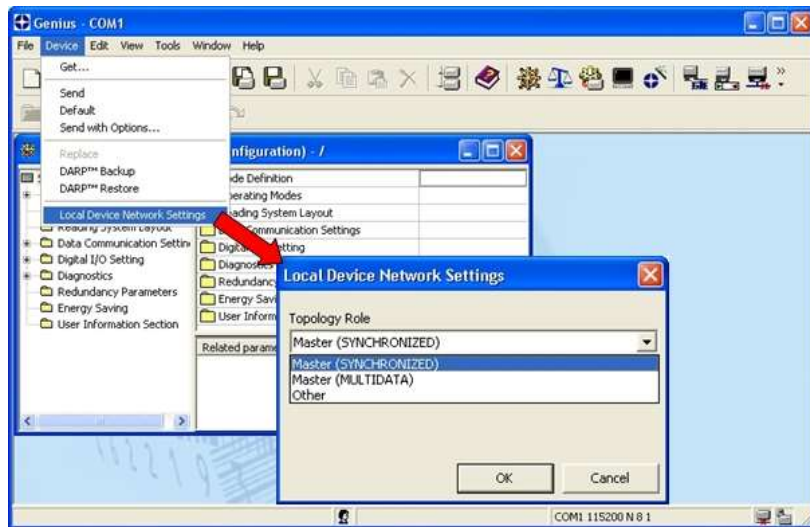



Figure 34 – Local Device Network Settings

The following dialog box appears asking whether to send the updated configuration to the Local Device or not:



- Click the “Yes” button, then click on the  icon available on the Toolbar to make the “Devices” area appear next to the Parameter Explorer window. By repeatedly clicking the icon this area will be displayed or hidden.

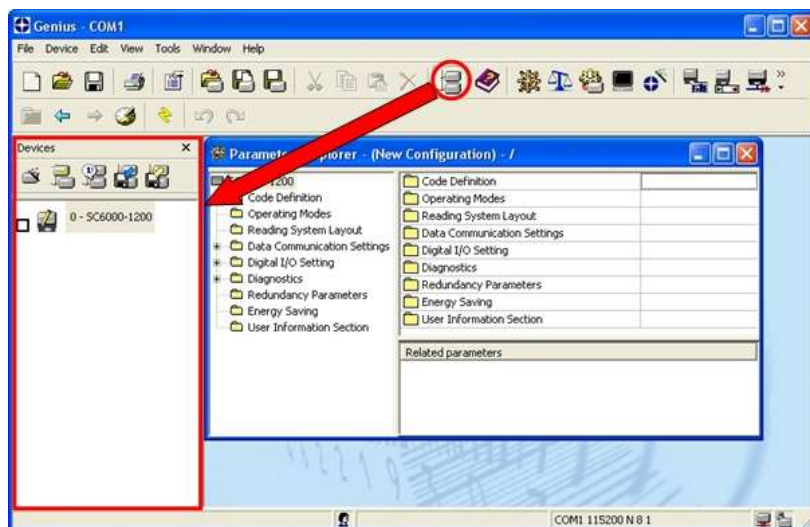


Figure 35 – View Device Configuration

Each device is indicated by the following graphical objects:



- check box allowing to select/deselect a specific device to perform the desired operations (i.e. program downloading);
 - icon representing the device status;
 - a label reporting information transmitted by the device when connected (the device address, generated errors, device description).
4. Then, proceed with the Network Setup (par. 3.2.1).
 5. Configure the SC6000 and Slave Scanner parameters according to your application using the configuration window in Genius™ for each device. The main steps are:
 - Configure the PackTrack parameters
 - Select the codes to be read
 - Set-up the communication parameters
 - Define data formatting parameters
 6. Send the configuration to the Slave Scanners from the Send command in the Device Menu.
 7. Perform a DARP™ backup by clicking the relative icon in the Device Network area.

3.2.1 Genius™ Network Setup Through Master

Network Setup allows configuring your Local Lonworks Network through the Master using Genius™.

Three different procedures are available to define the number of network slave scanners, their label and address according to two main conditions:

Condition	Available Procedure	Feature
<u>Unknown Slave Addresses</u>	Net-Autoset	automatically assigns random addresses to slave or Stand Alone scanners.
<u>Known Slave Addresses</u>	Network Wizard	customizes the network (slave label and address definition and physical identification of a specific slave within network), updates configuration to a file and makes it ready to be sent to the Master.
	Express Network Setup	automatically performs all the operations of the Network Wizard apart from the physical identification of a specific slave scanner.



NOTE

The Network Setup procedure as described requires Genius™ software version 1.06 or later. In addition, the Net-Autoset procedure requires scanner software version 6.40 or later.

Proceed with the network setup by using one of the icons available on the Tool Bar according to the procedure to follow:



= Net-Autoset procedure



= Network Wizard procedure




= Express Network Setup procedure

Net-Autoset

This procedure is to be used when all scanner addresses and labels are unknown (typically when configuring the network for the first time or whenever a network reconfiguration is required).



By clicking the  icon or selecting the “Net_Autoset” option from the right-click menu, the Net-Autoset procedure is started allowing automatic assignment of random addresses to all slave or Stand Alone scanners connected within the network.

Once the procedure has been completed, it is possible to:


- define customized addresses and labels through the Network Wizard;
- display the scanner default labels through the Express Network Setup.

Express Network Setup

Before performing this procedure, a Lonworks address must be assigned to each slave scanner. The most practical method is through the [Net-Autoset](#) procedure. See par. 3.2.2 for alternative address assignment methods.

Once all addresses have been assigned, the Express Network Setup is to be used when all scanner addresses and labels do not need to be modified.



By clicking on the  icon or by choosing the related option from the right-click menu, the procedure is started which automatically performs the following operations:

- opening the wizard;
- polling the network to discover connected scanners;
- transferring all scanners found to the “Requested Devices” area of the wizard where your network customization is defined;
- saving the new network configuration;

Once the procedure has been completed, a dialog box will appear asking whether to send the configuration to the Master. Choose the “Yes” option to start this procedure.

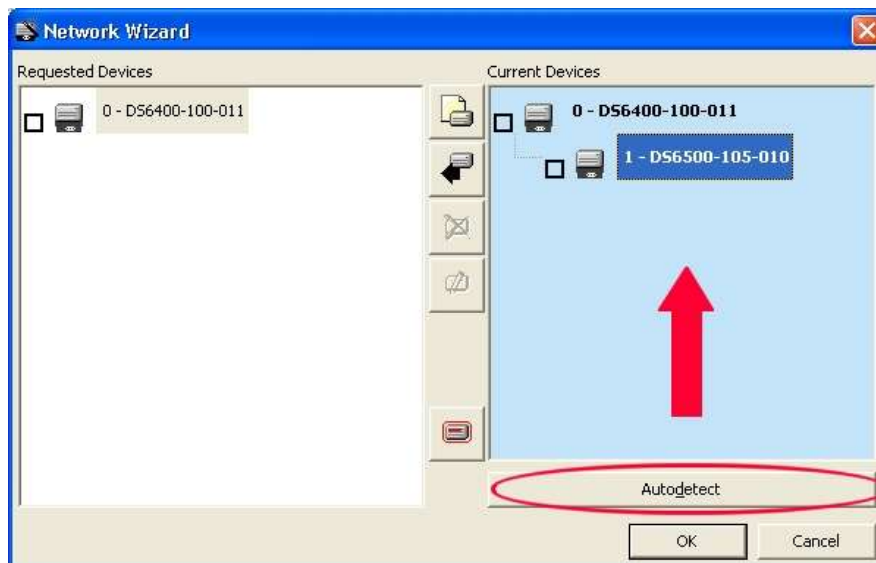
Network Wizard

Before performing this procedure, a Lonworks address must be assigned to each slave scanner. The most practical method is through the [Net-Autoreset](#) procedure. See par. 3.2.2 for alternative address assignment methods.


Once all addresses have been assigned, the Network Wizard is to be used when one or more scanner addresses and labels need to be modified.

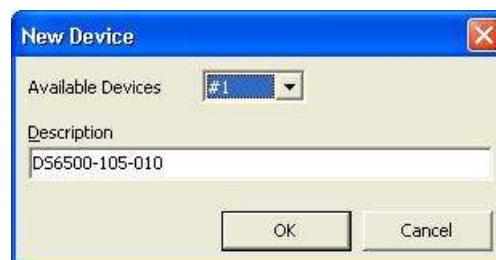


1. Click on the  button to open the Network Wizard dialog box:



- a. if the slave scanners have already been configured and wired to the network, click on the Autodetect button to start a polling procedure of the current network. All slave scanners found will be represented in the “Current Devices” area. Then, select the


desired slave scanner from the “Current Devices” area and click on the  icon (or drag and drop) to transfer it to the “Requested Devices” area where your network customization is defined. The following dialog box will appear allowing (if necessary) to change the slave address (“Available Device” field) and label (“Description” field):

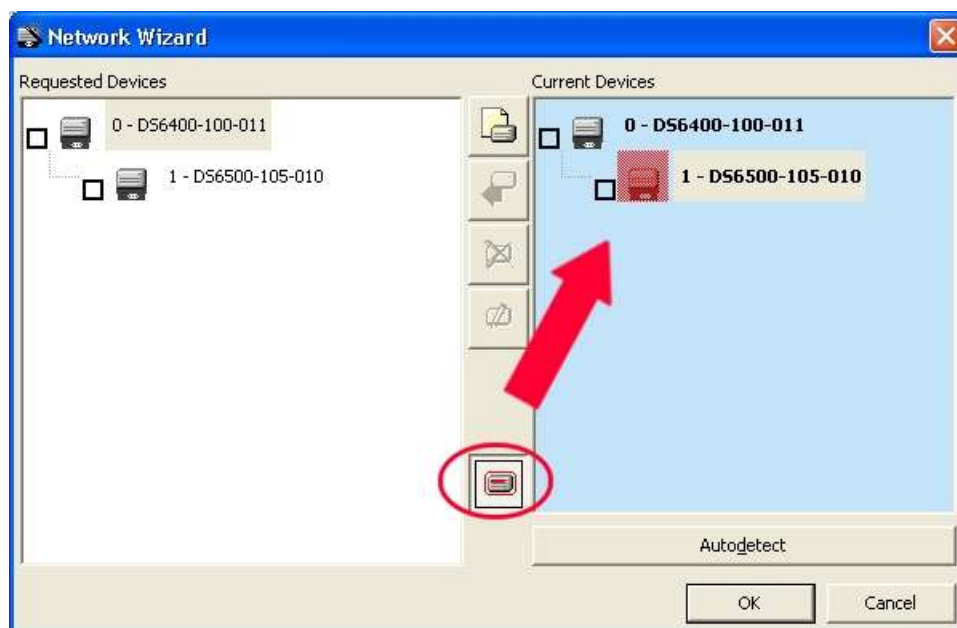


- b. if the slave scanners have not been configured and wired to the network, click on the




icon to add a new device defining its address and model. The added slave scanner will be displayed in the “Requested Devices” area. This option in any case requires that all slave scanners have their address set before the network can function.

- If desired, select a slave scanner within the “Current Devices” area and click on the  icon (or select the “Show Device” option from the right-click menu) to make the dialog box appear as follows:



The “Show Device” option is particularly useful after the Net-Autoset procedure or whenever it is necessary to know which address is assigned to a specific slave scanner. Indeed, it activates the following signals which physically indicate the scanner corresponding to the one selected, in particular:

- in Network Wizard the icon corresponding to the selected slave scanner starts blinking red;
 - in the Physical Network all slave scanner lasers turn off except the one of the selected scanner which turns on.
- If desired, select the transferred/added slave scanner within the “Requested Devices” area and click on the  icon to customize the scanner label and address.
 - Once your network has been customized, close the network wizard. Before closure, the program will show a dialog box asking whether to send the new configuration to the Master. Choose the “Yes” option to start this procedure.

3.2.2 Alternative Slave Address Assignment

As alternatives to Network Setup through the Master, each Slave scanner can be assigned an address through the following methods:

- random address assignment from SC6000 to all slaves in the network by performing the CASP™ procedure as described in par. 0;
- address setting through the Local Device Network Settings item in the Device Menu with the slave scanner connected locally to Genius™;



- manual address setting through slave scanner keyboard (see par. “Internal Net” in the relative Scanner Reference Manual for details);

3.3 GUIDE TO RAPID CONFIGURATION FOR SC6000 AS CONTROLLER LON OLD8K

This configuration is valid when the network is composed of DS8100 or DX8200 slave scanners.

- 1) Connect to each scanner Debug port and set a Lonworks Node address which must be different and consecutive (i.e. 1, 2, 3, 4, etc.).
- 2) Make all the necessary PackTrack parameter settings.
- 3) Run Genius™ from the configuration PC. The following window appears asking to select the configuration mode.



Figure 36 – Genius™ Wizard Opening Window

Select Advanced. The Wizard option is not currently available for SC6000.

- 4) From the Device Menu select Local Device Network Settings and configure your SC6000 as **Other**, as shown in the figure below:



Figure 37 – Local Device Network Settings

- 5) From the Reading System Layout folder and configure the following parameters:
- Device Assignment = Controller Lon Old8K
 - Number of Slaves = according to your application
 - Check the Modify Lon Slave Configuration

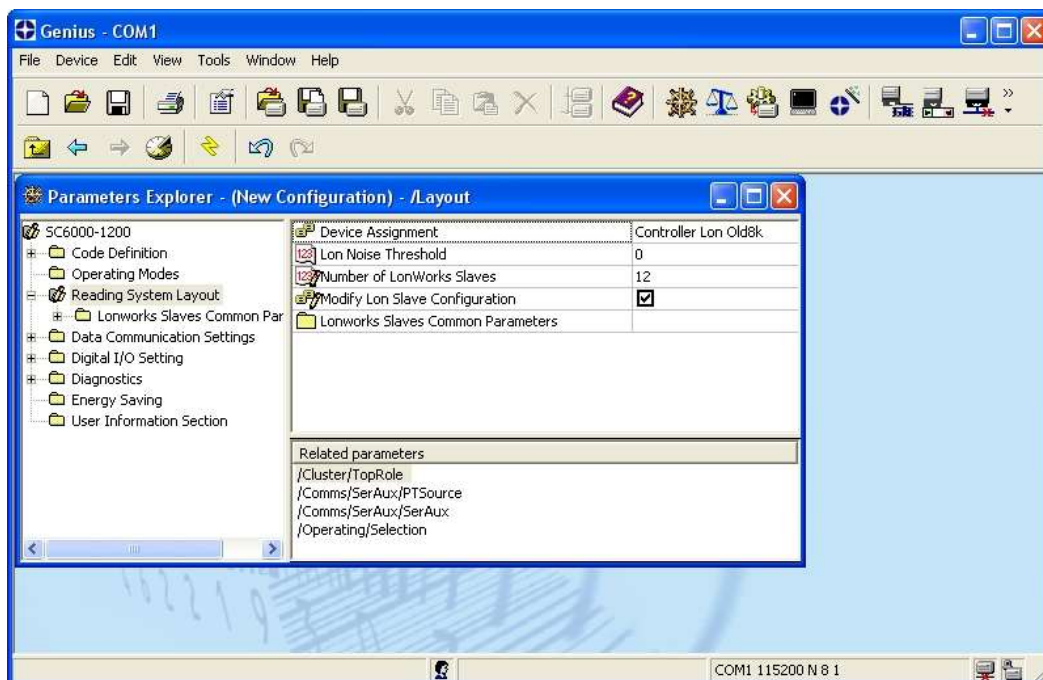


Figure 38 – SC6000 Device Assignment Configuration

- 6) Configure the Common Slave Scanner parameters according to your application using the Lonworks Slave Common Parameters branch in the Reading System Layout folder.

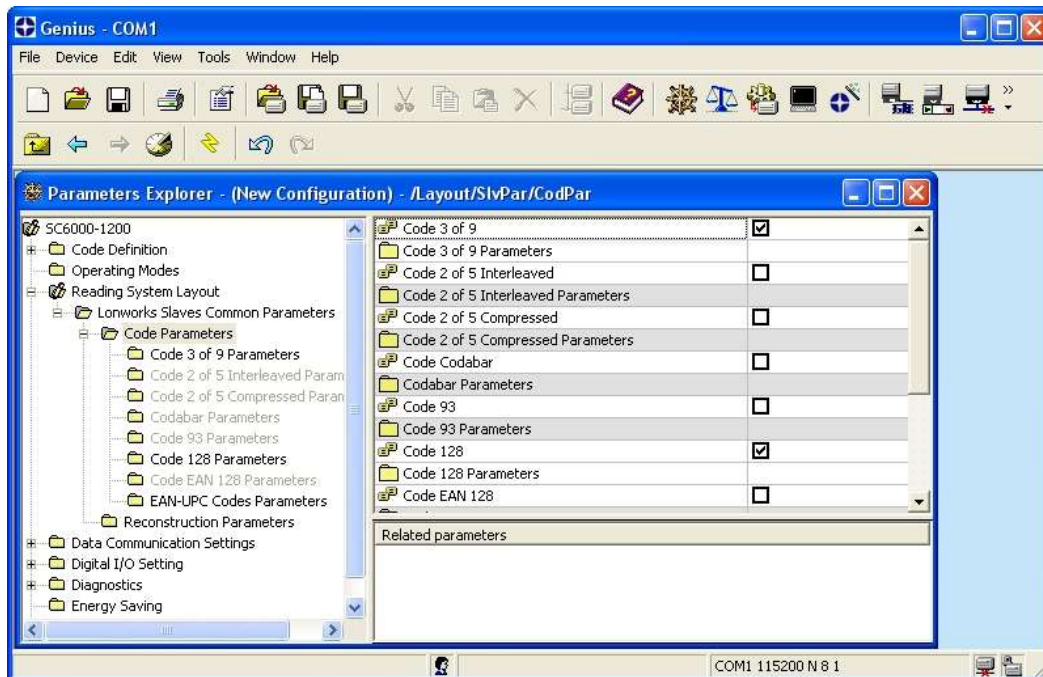
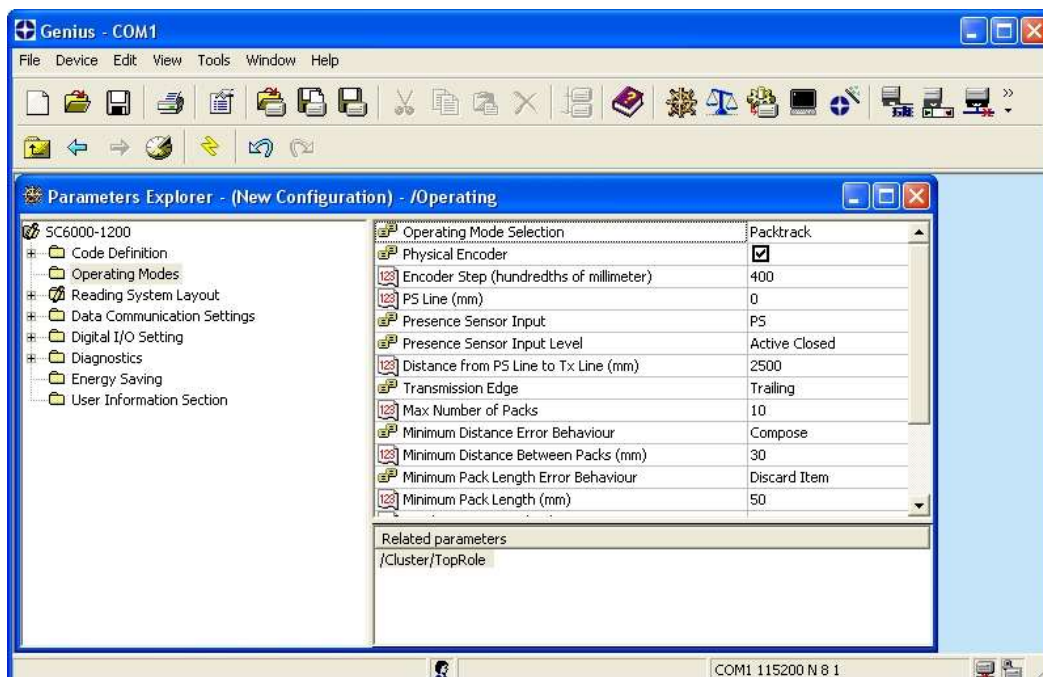


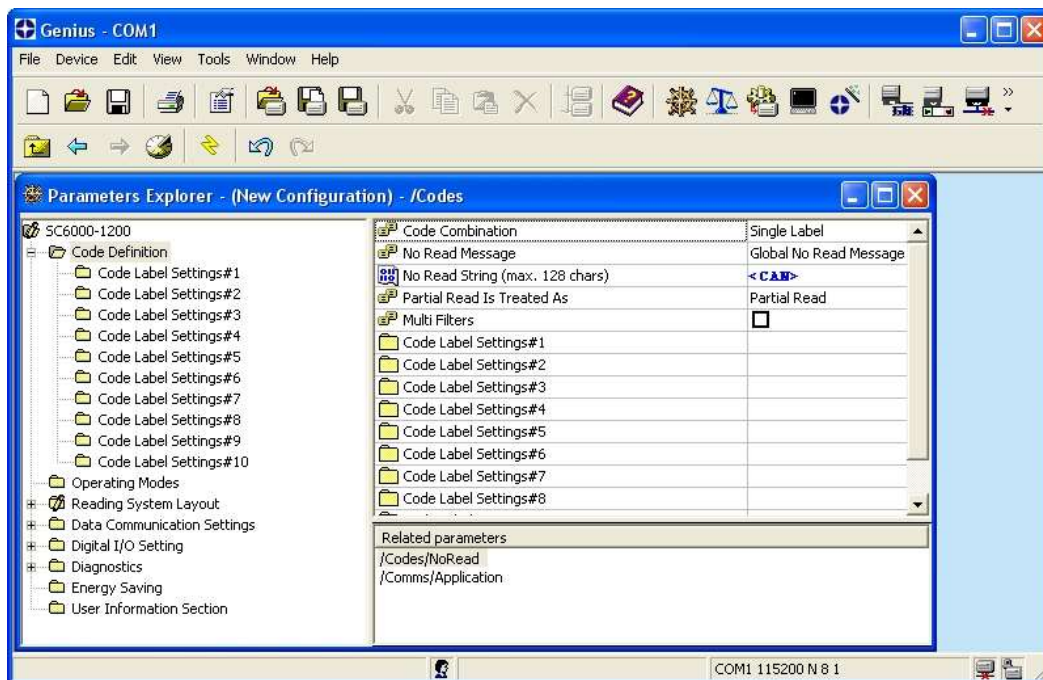
Figure 39 – Common Slave Scanner Code Selection Configuration

- 7) Configure the SC6000 parameters according to your application using the various configuration folders. The main steps are:

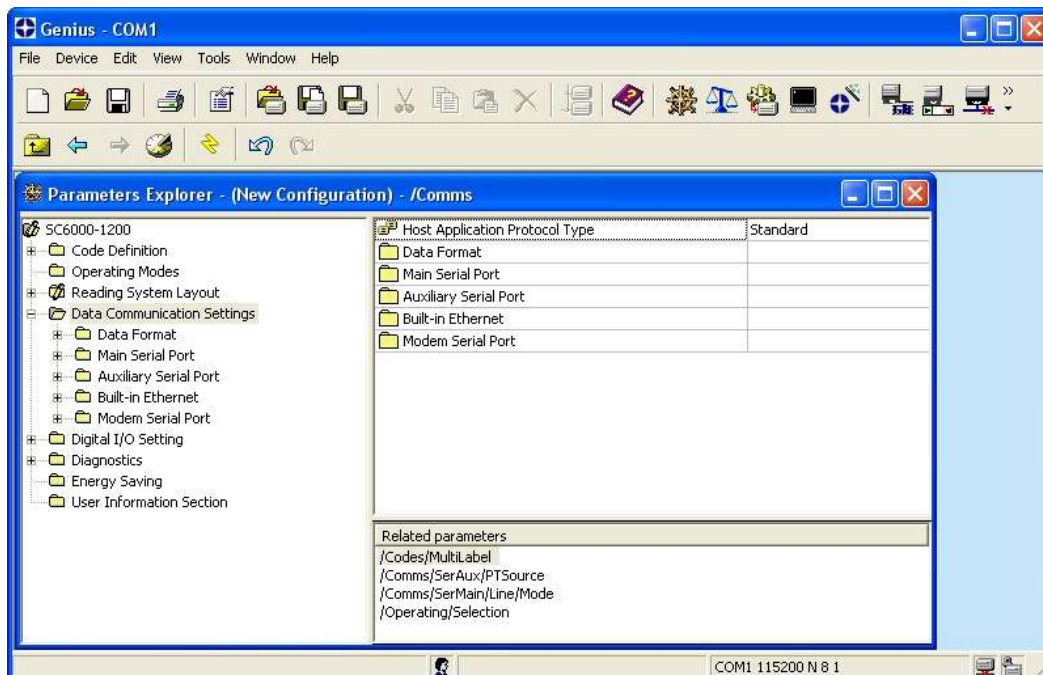
- Configure the PackTrack parameters in the Operating Modes folder



- Selecting the codes to be read in the Code Definition folder
(they must be the same as those set for the slave scanners)



- Set-up the communication and data formatting parameters in the Data Communications settings folder



- 8) Send the configuration to the Slave Scanners from the Send command in the Device Menu.

3.4 PARAMETER DEFAULT VALUES

The following table contains the list of the factory default settings for the SC6000 Controller. Genius™ also allows checking the parameter default values by selecting the “Compare parameters” option available in the Tools menu and comparing the current SC6000 configuration to the default one.

Parameter	Default Setting
Code Definition	
Code Combination	Single Label
No Read Message	Global No Read Message
No Read String (128 characters max)	<CAN>
Partial Read is Treated As	Partial Read
Multi Filters	Disabled (unchecked)
Code Label Settings#1	
Enable	Enabled (checked)
Code Symbology	Interleaved 2 of 5
Label Length	8
Min Code Position	0
Max Code Position	255
CheckDigit	Disabled (unchecked)
Pattern Match String (200 char. max)	NULL
Code Label Settings#2	
Enable	Enabled (checked)
Code Symbology	Code39
Label Length	Variable
Minimum Label Length	1
Maximum Label Length	60
Min Code Position	0
Max Code Position	255
CheckDigit	Disabled (unchecked)
Pattern Match String (200 char. max.)	NULL
Operating Modes	
Operating Mode Selection	PackTrack
Physical Encoder	Enabled (checked)
Encoder Step	400
PS Line	0
Presence Sensor Input	PS
Presence Sensor Input Level	Active Closed
Distance from PS Line to Tx Line	2500
Transmission Edge	Trailing
Max Number of Packs	10
Minimum Distance Error Behaviour	Compose
Minimum Distance between Packs	30
Minimum Pack Length Error Behaviour	Discard Item
Minimum Pack Length	50
Window Dimension	15
Encoder Delay Error Behaviour	Safe Resync

<u>Parameter</u>	<u>Default Setting</u>
Operating Modes	
Max Encoder Delay for Code	400
Max Consecutive Delayed Codes	3
Max Safe Resync for Node	3
Bidirectional	Disabled (unchecked)
Encoder Divided by 2	Disabled (unchecked)
Beam Shutter Triggered	Disabled (unchecked)
Protocol Index	Disabled (unchecked)
Hybrid System	Disabled
Reading System Layout	
Enable Automatic Replacement (D.A.R.P)	Enabled (checked)
Data Communication Settings	
Host Application Protocol Type	Standard
<u>Data Format</u>	
Header TX Start	With Data
Termination After No Read Message	Enabled (checked)
Code Identifier	Disabled
Standard Parameters	
Header String	<STX>
Code Position	Disabled (unchecked)
Code Direction Identifier Enable	Disabled (unchecked)
Termination String	<CR><LF>
Data Packet Separators	<CR><LF>
Code Field Length Setting	Variable Length
Multidata	
Address Tx	Disabled (unchecked)
<u>Main Serial Port</u>	
Data TX	Enabled (checked)
Heartbeat	Disable
Parameters	
Main Port Communication Mode	Standard
Main Port Electrical Interface	RS232
Handshake	None
Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits	1
<u>Auxiliary Serial Port</u>	
Data TX	Enabled (checked)
Heartbeat	Disable
Pass Through	Disabled (checked)
Parameters	
Baud Rate	115200
Parity	None
Data Bits	8
Stop Bits	1

<u>Parameter</u>	<u>Default Setting</u>
<u>Built-in Ethernet Port</u> LineParameters Status Eth_speed DHCP IP_address IP_netmask IP_gateway IP_dns1 IP_dns2 Services	Enabled (checked) Auto Disabled (unchecked) 172.16.11.221 255.255.0.0 127.0.0.1 127.0.0.1 127.0.0.1 All disabled (unchecked)
<u>Modem Serial Port</u> Data Tx Parameters Baud Rate Modem Enabled	Disabled (unchecked) 38400 Disabled (unchecked)
<u>Digital I/O Settings</u> <u>Digital Input Lines Settings</u> Debouncing for Input 1, 2 and 3 Debouncing for Encoder Debouncing for PS and PSAUX PS Active Level (Overridden by Op. Mode) PSAUX Active Level (Overridden by Op. Mode) Input 1 Active Level (Overridden by Op. Mode) Input 2 Active Level (Overridden by Op. Mode) Input 3 Active Level (Overridden by Op. Mode)	5 ms 500 μ s 5 ms Active Closed Active Closed Active Closed Active Closed Active Closed
<u>Digital Output Lines Setting</u> <u>Output 1</u> Use Line State Activation Event Alternative Activation Event Deactivation Event Alternative Deactivation Event Activate on Error Deactivate when Errors Recovered Deactivation Timeout (ms)	Local Normally Open Complete Read Multiple Read Timeout None Disabled (unchecked) Disabled (unchecked) 50
<u>Output 2</u> Use Line State Activation Event Alternative Activation Event Deactivation Event Alternative Deactivation Event	Local Normally Open No Read Partial Read Timeout None

<u>Parameter</u>	<u>Default Setting</u>
<u>Output 2</u> Activate on Error Deactivate when Errors Recovered Deactivation Timeout (ms)	Disabled (unchecked) Disabled (unchecked) 50
<u>Output 3</u> Use Line State Activation Event Alternative Activation Event Deactivation Event Alternative Deactivation Event Activate on Error Deactivate when Errors Recovered	Local Normally Open None None None None None Disabled (unchecked) Disabled (unchecked)
<u>Output 4</u> Use Line State Activation Event Alternative Activation Event Deactivation Event Alternative Deactivation Event Activate on Error Deactivate when all Errors Recovered	Local Normally Open None None None None Disabled (unchecked) Disabled (unchecked)
<u>Output 5</u> Use Line State Activation Event Alternative Activation Event Deactivation Event Alternative Deactivation Event Activate on Error Deactivate when Errors Recovered	Local Normally Open None None None None Disabled (unchecked) Disabled (unchecked)
<u>Output 6</u> Use Line State Activation Event Alternative Activation Event Deactivation Event Alternative Deactivation Event Activate on Error Deactivate when Errors Recovered	Local Normally Open None None None None Disabled (unchecked) Disabled (unchecked)
<u>Relays</u> <u>Relay 1</u> Line State Activation Event Alternative Activation Event	Normally Open None None

<u>Parameter</u>	<u>Default Setting</u>
<u>Relays</u>	
<u>Relay 1</u>	
Deactivation Event	None
Alternative Deactivation Event	None
Activate on Error	Disabled (unchecked)
Deactivate when Errors Recovered	Disabled (unchecked)
<u>Relay 2</u>	
Line State	Normally Open
Activation Event	None
Alternative Activation Event	None
Deactivation Event	None
Alternative Deactivation Event	None
Activate on Error	Disabled (unchecked)
Deactivate when Errors Recovered	Disabled (unchecked)
<u>Relay 3</u>	
Line State	Normally Open
Activation Event	None
Alternative Activation Event	None
Deactivation Event	None
Alternative Deactivation Event	None
Activate on Error	Disabled (unchecked)
Deactivate when Errors Recovered	Disabled (unchecked)
System Information Section	
User Interface Style	Standard
Show Last Code Window	Disabled (unchecked)
Last Code & Reading Mask Window	Statistics on Last 100 Codes
D.A.R.P. Scanner Compatibility Check	Enabled (checked)
Diagnostics	
PKTr Debug Msg Tx	Disabled (unchecked)
Enable	Disabled (unchecked)
Redundancy Parameters	
Reds Functionality	Disabled (unchecked)
Topology Redundancy Role	Master Alone
Energy Saving	
Energy Saving Configuration	Disabled (unchecked)

4 MAINTENANCE

4.1 DATALOGIC AUTOMATIC REPLACEMENT PROCEDURE (DARP™)

When SC6000 is used as a SYNCHRONIZED or MULTIDATA Master (Topology Role parameter), a DARP™ backup procedure must be performed to automatically manage scanners and SC6000 replacement in case of failure (DARP™ Restore). Once the system configuration has been completed as described in par. 3.2, launch the DARP™ backup by one of the following methods:

Using Genius:

Click on the DARP™ backup icon in the Device Network area. You will be prompted to select the desired backup option (complete, all scanners, controller, or each single scanner).

Using the SC6000 keypad:

1. Press the <Ent> and <Menu> keys simultaneously to enter the Menu;
2. Use the <arrow> keys to move within the menu items;
3. In the <System> menu choose <Backup> and select the desired backup option (complete, all scanners, controller, or each single scanner).

The SC6000 Controller will store the complete system configuration on the Compact Flash card.

If a slave scanner has to be replaced, the corresponding configuration (node address, code configuration, PackTrack™ configuration, etc.) is automatically downloaded by the SC6000 into the new scanner at the next system startup.



NOTE

All replacement scanners must be set to the factory default values.

In case of SC6000 failure, the complete system configuration can be recovered from the Compact Flash of the damaged SC6000: by simply installing the old Compact Flash in the new SC6000, the system configuration is automatically restored and the reading station is ready to start working again.



CAUTION

Before removing the Compact Flash card, switch the SC6000 Controller off.

In case of SC6000 failure proceed as follows:

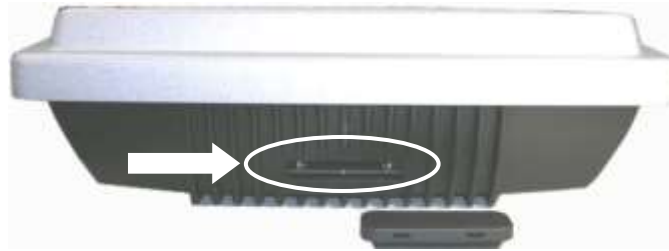


Figure 40 - Removing the Compact Flash

1. Disconnect the device
2. Remove the rubber cover of the Compact Flash slot using a screwdriver
3. Remove the Compact Flash
4. Connect a new SC6000 to the system
5. Insert the Compact Flash card



CAUTION

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

6. Start up the system

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

4.2 AUTOMATIC SCANNER REPLACEMENT (ASR)

When SC6000 is used in a network of DS8100 or DX8200 scanners, (Topology Role parameter = Other; Device Assignment parameter = Controller Lon Old8K), an ASR backup procedure must be performed to automatically manage scanners and SC6000 replacement in case of failure (ASR Restore).



NOTE

In order for the ASR procedure to work on DS8100 or DX8200 slave scanners, they must have been installed according to the procedure in par. 3.3.

Once the system configuration has been completed, launch the ASR backup by one of the following methods:

Using Genius:

Click on the ASR backup item in the Device Menu. You will be prompted to select the desired backup option (complete, all slaves, controller).

Using the SC6000 keypad:

1. Press the <Ent> and <Menu> keys simultaneously to enter the Menu;
2. Use the <arrow> keys to move within the menu items;
3. In the <System> menu choose <Backup> and select the desired backup option (complete, all scanners, controller).

The SC6000 Controller will store the complete system configuration on the Compact Flash card.

If a slave scanner has to be replaced, the corresponding configuration (node address, code configuration, PackTrack™ configuration, etc.) is automatically downloaded by the SC6000 into the new scanner at the next system startup.

**NOTE**

All replacement scanners must be set to the factory default values.

**NOTE**

If the SC6000 controller replaces an SC8000 controller within the network, (Topology Role parameter = Other; Device Assignment parameter = Controller Lon SC8000), refer to the "Replacing SC8000 with SC6000-PWO.pdf" document for details.

5 TROUBLESHOOTING



NOTE

Before contacting your local Datalogic office or Datalogic Partner or ARC, it is suggested to save the device configuration to a *.ddc file by means of the Genius™ software configuration program and check the exact device model and serial number.

TROUBLESHOOTING GUIDE	
Problem	Suggestion
Power On: the "Power On" LED is not lit.	<ul style="list-style-type: none"> • Is power connected? • If using a power adapter, is it connected to PWO 25-pin cable?
On Line Mode 1: the "PS" LED is not lit (when external trigger activates).	<ul style="list-style-type: none"> • Check carefully if you are referring to the 25-pin connector of the PWO. • Is sensor connected to PWO PS input? • Is power supplied to photo sensor?
On Line Mode 1: the "PS" LED is correctly lit but nothing happens (no reading results).	<ul style="list-style-type: none"> • Is the software configuration consistent with the application condition (operating mode, etc.)? In the Genius™ software configuration program select the OPERATING MODES folder and check for related parameters.
Serial On Line Mode: the reader is not triggered (no reading results).	<ul style="list-style-type: none"> • In the Genius™ program select the OPERATING MODE folder and check if serial on line is enabled as "On Line options" parameter value. • Are the Start-Stop strings correctly assigned? • Is the serial trigger source correctly connected and configured)?
On Line Mode and Serial On Line Mode: the reader does not respond correctly to the expected external signal end.	<ul style="list-style-type: none"> • In the Genius™ software configuration program select the OPERATING MODES folder and check the "Reading Phase Timeout" parameterization.
Communication (Main / Aux): the device is not transmitting anything to the host.	<ul style="list-style-type: none"> • Is serial Main / Aux cable connected? • Is wiring correct? • If using the Main RS232 or RS485 interface, is the reference ground connected to GND_ISO? Be careful that it is not completely different from GND power ground. • Are serial host settings equivalent to serial device setting? • When using the Main interface, Tx Data and Rx Data LEDs must be lit during data transfer.

TROUBLESHOOTING GUIDE	
Problem	Suggestion
Communication (Ethernet): the Ethernet LED is not lit.	<ul style="list-style-type: none"> • Verify the HUB connection. • Verify Genius™ settings (see par. 3.4).
Communication: data do not appear on the terminal.	<ul style="list-style-type: none"> • In the Genius™ program enable the DATA COMMUNICATION SETTINGS/MAIN-AUXILIARY PORT\DATA TX parameter.
Communication: data transferred to the host are incorrect, corrupted or incomplete.	<ul style="list-style-type: none"> • In the Genius™ program select the DATA COMMUNICATION SETTINGS/DATA FORMAT folder and check for HEADER, TERMINATOR, SEPARATOR and FILL CHAR values. • Check the CODE FIELD LENGTH value. • Are the COM port parameters correctly assigned?
How do I obtain my units' serial numbers?	<ul style="list-style-type: none"> • The device serial number is printed on a label that is affixed on the bottom of SC6000 Controller. • The serial number is also displayed when connecting the device through the Genius™ program. • Serial numbers consist of 9 characters: one letter, 2 numbers, another letter followed by 5 numbers.

6 TECHNICAL FEATURES

ELECTRICAL FEATURES		
Supply Voltage	10 to 30 Vdc	
Power Consumption	6.5 W typical 800 mA to 300 mA max. (including startup current)	
Communication Interfaces	Main (isolated)	Modem
	RS232	RS232
	RS485 full-duplex	Auxiliary
		RS232
	Other	
	Lonworks	1.25 Mb/s
	Ethernet	100 Mb/s
Model-Dependent Communication Interfaces	Ethernet (dual) DeviceNet Profibus	100 Mb/s up to 500 Kb/s up to 12 Mb/s
Inputs (optocoupled NPN or PNP)	Encoder, PS, PS Aux, 3 polarity insensitive optocoupled inputs	
Outputs (optocoupled)	6 optocoupled outputs, 3 relay control outputs	
USER INTERFACE		
LCD Display	4 lines by 20 characters LCD	
Keypad	6 keys	
LED Indicators	Power ON TX data RX data Ethernet PS	PS Aux TACH Networks Controller Scanners
SOFTWARE FEATURES		
Configuration Modes	Genius™ utility program	
Parameter Storage	Non-volatile extractable FLASH 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 @ 70-200 Hz; 2 hours on each axis	
Shock Resistance EN 60068-2-27	30 g; 11 ms; 3 shocks on each axis	
Protection Class EN 60529	IP64*	
PHYSICAL FEATURES		
Mechanical Dimensions	320 x 250 x 90 mm (12.6 x 9.84 x 3.54 in)	
Weight	3.3 kg. (7.26 lb)	

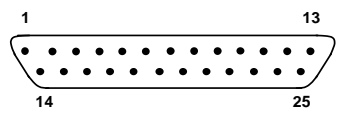
* sealed connectors required, including the Harting RJ Industrial® Push Pull Ethernet connector.

A ALTERNATIVE CONNECTIONS REFERENCE

POWER SUPPLY - I/O (POWER/NET CONNECTOR)

The PWO supplies 24 VDC.

25-pin D-Sub Female Connector Pinout		
Pin	Name	Function
1	REL1	Relay output control
2	REL3	Relay output control
3	GND	Ground
4	GND	Ground
5	ENCODER A	Encoder (Tach)
6	PS_AUX A	Presence sensor aux.
7	PS A	Presence sensor
8	SYS_ENC_I/O	System signal
9	RES	Reserved
10	RES	Reserved
11	SHIELD_OUT	Lonworks
12	LON_OUT B	Lonworks
13	LON_OUT A	Lonworks
14	REL2	Relay output control
15	RES	Reserved
16	VS	Supply voltage
17	ENCODER B	Encoder (Tach)
18	PS_AUX B	Presence sensor aux
19	PS B	Presence sensor
20	SYS_I/O	System signal
21	RES	Reserved
22	RES	Reserved
23	SHIELD_IN	Lonworks
24	LON_IN B	Lonworks
25	LON_IN A	Lonworks



25-pin Male D-sub Connector

Pin references with the denomination A and B are polarity insensitive signals.

Power

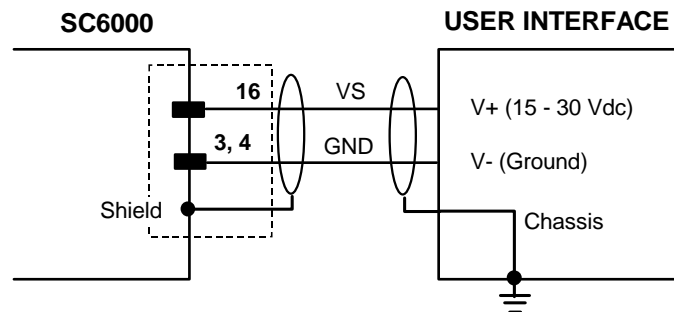


Figure 41 – Power Supply Connection

Lonworks

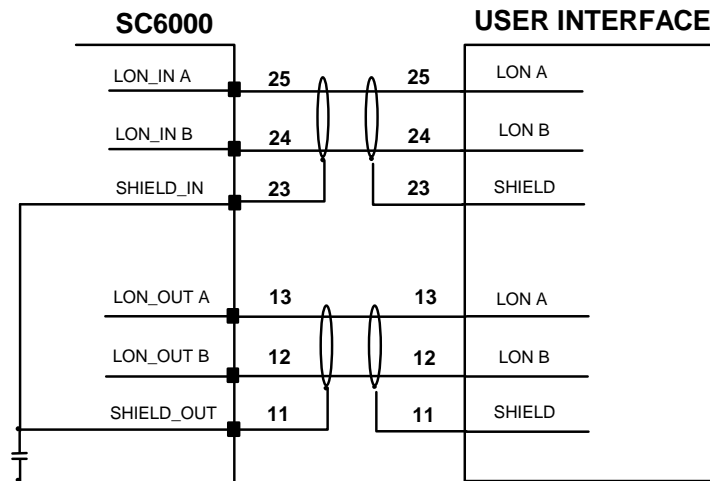


Figure 42 – SC6000 Lonworks Connection

PS/PS AUX/Encoder

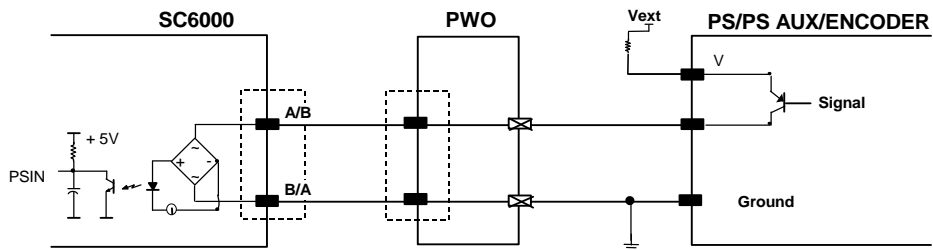


Figure 43 - PNP Command Input with Electrical Isolation

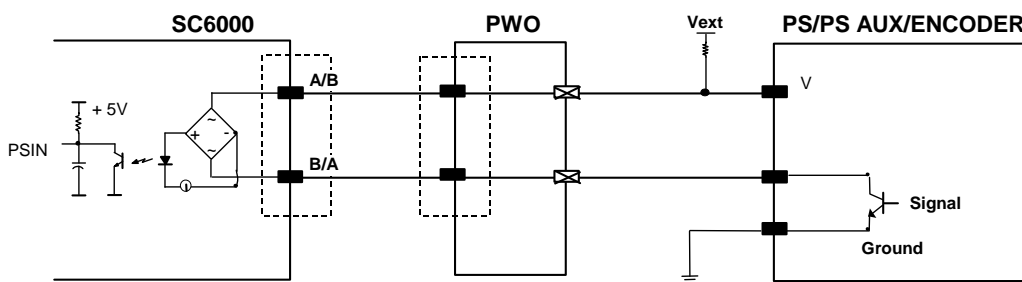
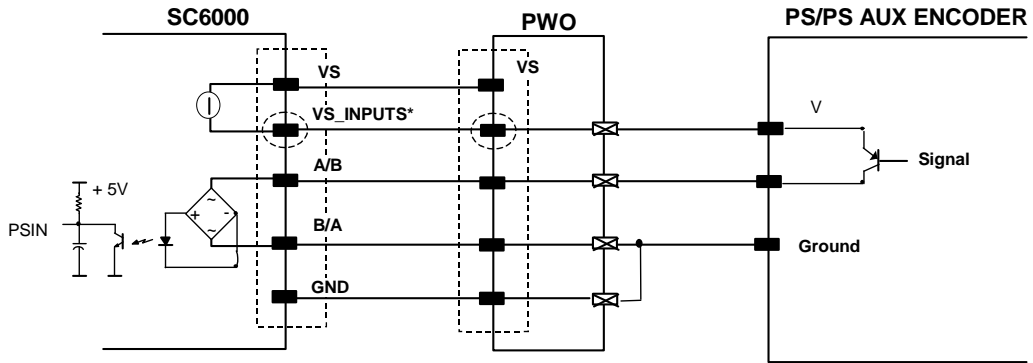
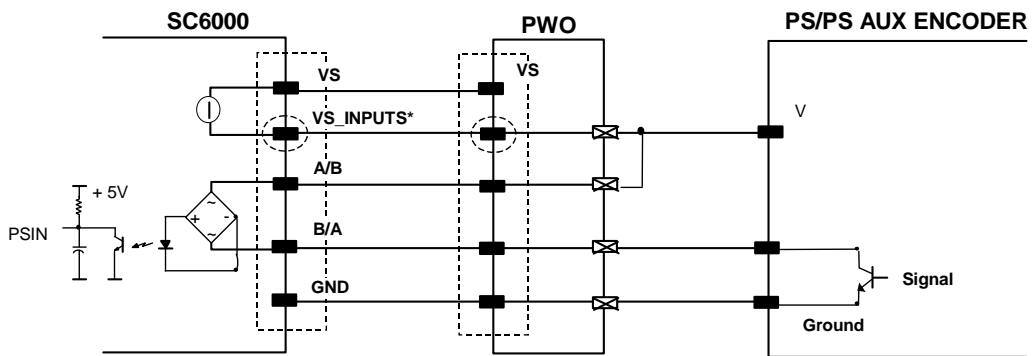


Figure 44 - NPN Command Input with Electrical Isolation



*VS_INPUTS is connected through the 25-pin Extended I/O connector. If this connector is not used, VS_INPUTS must be wired from one of the scanner terminals inside PWO, see the PWO Reference Manual for details.

Figure 45 - PNP Command Input Using System Power

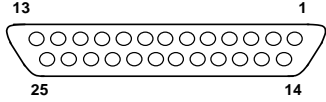


*VS_INPUTS is connected through the 25-pin Extended I/O connector. If this connector is not used, VS_INPUTS must be wired from one of the scanner terminals inside PWO, see the PWO Reference Manual for details.

Figure 46 - NPN Command Input Using System Power

EXTENDED I/O

25-pin D-Sub Male Connector Pinout		
Pin	Name	Function
1	VS_OUTPUTS	Power for outputs
2	IN1 A	Input signal 1 - polarity insensitive
3	IN2 A	Input signal 2 - polarity insensitive
4	IN3 A	Input signal 3 - polarity insensitive
5	GND	Ground
6	OUT1+	Configurable digital output 1 - positive pin
7	OUT2+	Configurable digital output 2 - positive pin
8	OUT3+	Configurable digital output 3 - positive pin
9	VS_INPUTS	Power for inputs
10	OUT4+	Configurable digital output 4 - positive pin
11	OUT5+	Configurable digital output 5 - positive pin
12	OUT6+	Configurable digital output 6 - positive pin
13	GND	Ground
14	GND	Ground
15	IN1 B	Input signal 1 - polarity insensitive
16	IN2 B	Input signal 2 - polarity insensitive
17	IN3 B	Input signal 3 - polarity insensitive
18	GND	Ground
19	OUT1-	Configurable digital output 1 - negative pin
20	OUT2-	Configurable digital output 2 - negative pin
21	OUT3-	Configurable digital output 3 - negative pin
22	GND	Ground
23	OUT4-	Configurable digital output 4 - negative pin
24	OUT5-	Configurable digital output 5 - negative pin
25	OUT6-	Configurable digital output 6 - negative pin



25-pin Female D-sub Connector

Inputs

All inputs are optocoupled.

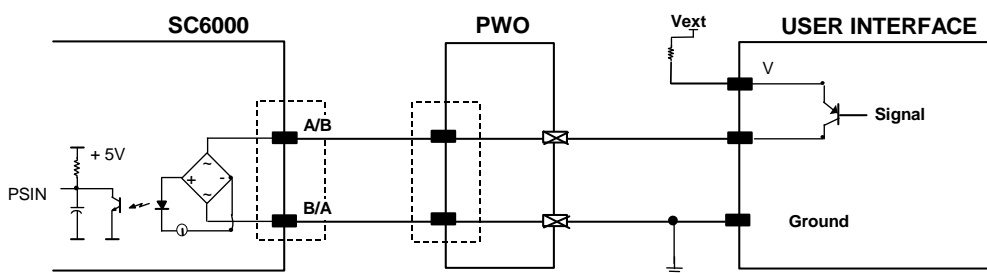


Figure 47 – PNP Command Input with Electrical Isolation

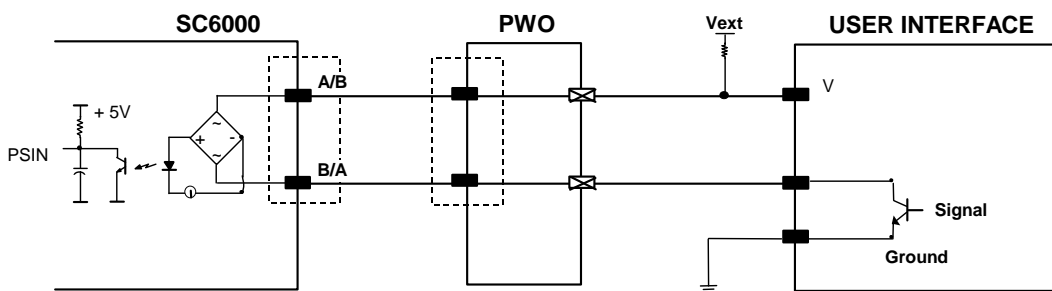


Figure 48 - NPN Command Input with Electrical Isolation

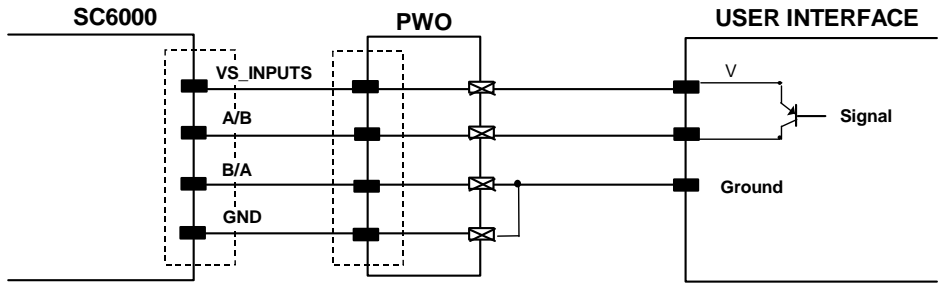


Figure 49 - PNP Command Input Using System Power

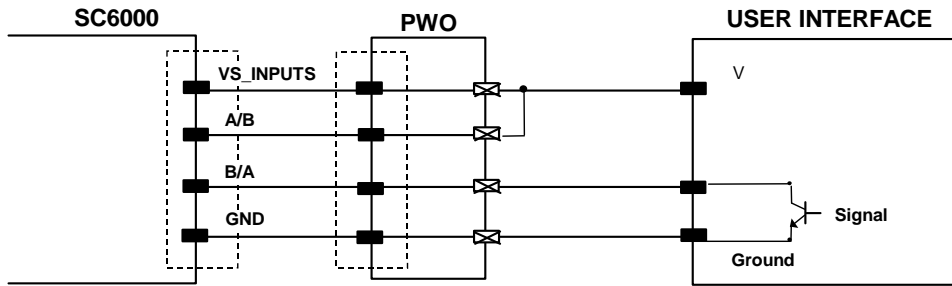


Figure 50 - NPN Command Input Using System Power

Isolation between the command logic and the scanner is maintained by powering the inputs with an external supply voltage (V_{ext}). For convenience, the inputs can be powered using the VS_INPUTS signal on the SC6000 (pin 9). In this case, however, the device is no longer electrically isolated. The VS_INPUTS signal on the Extended I/O connector is short-circuit protected.

The electrical features of these inputs are:

- Maximum voltage 30 V
- Maximum current 10 mA

Outputs

Six general purpose outputs are available.

Pin	Name	Function
6	OUT 1+	Configurable digital output 1 – positive pin
19	OUT 1-	Configurable digital output 1 – negative pin
7	OUT 2+	Configurable digital output 2 – positive pin
20	OUT 2-	Configurable digital output 2 – negative pin
8	OUT 3+	Configurable digital output 3 – positive pin
21	OUT 3-	Configurable digital output 3 – negative pin
10	OUT 4+	Configurable digital output 4 – positive pin
23	OUT 4-	Configurable digital output 4 – negative pin
11	OUT 5+	Configurable digital output 5 – positive pin
24	OUT 5-	Configurable digital output 5 – negative pin
12	OUT 6+	Configurable digital output 6 – positive pin
25	OUT 6-	Configurable digital output 6 – negative pin

The function of all six outputs can be defined by the user.

Refer to Genius™ Help On-Line for further details.

By default, OUT1 is associated with COMPLETE READ event, which activates when the code has been read correctly. In case the reader has been programmed to read several codes within the same reading phase, the event activates when all codes have been read.

OUT2 is associated with NO READ event, which activates when no code has been read.

OUT3 - OUT6 are associated with NONE, which means that the output is always in line state.

Isolation between the command logic and the SC6000 is maintained by powering the outputs with an external supply voltage (V_{ext}). For convenience, the outputs can be powered using the VS_OUTPUTS signal on the SC6000 (pin 1). In this case, however, the device is no longer electrically isolated. The VS_OUTPUTS on the Extended I/O connector is short-circuit protected.

The electrical features of these outputs are:

Collector-emitter voltage	30 V Max.
Collector current	130 mA Max.
Saturation voltage (V_{CE})	1 V at 10 mA Max.
Maximum power dissipation	90 mW at 50°C (Ambient temperature).

The limit requested by the maximum power dissipation is more important than that of the maximum collector current: if one of these outputs is continuously driven, the maximum current must not be more than 40 mA although 130 mA may be reached in pulse conditions.

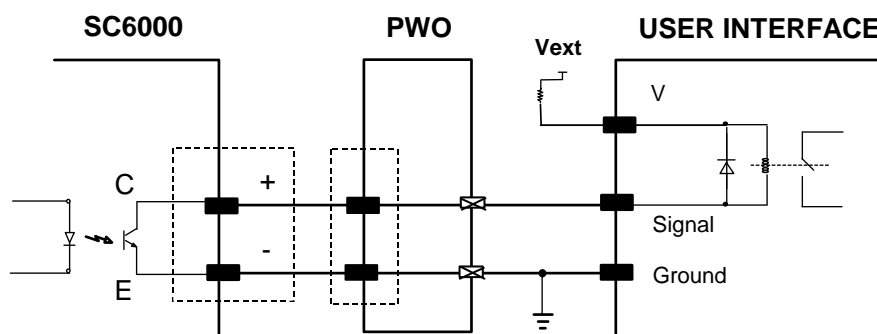


Figure 51 - Open Collector Output Connection with Electrical Isolation

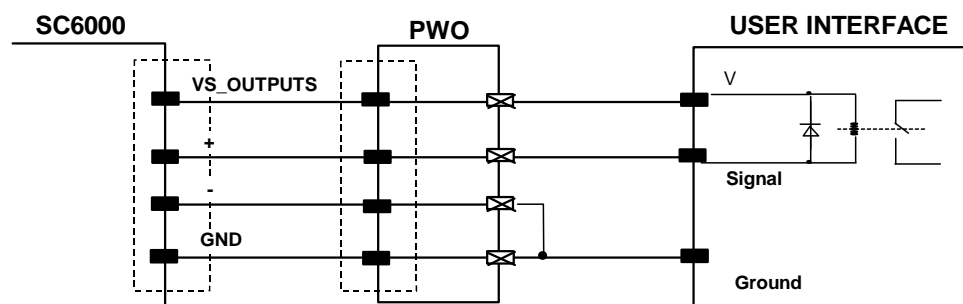


Figure 52 - Open Collector Output Connection Using System Power

GLOSSARY

Barcode

A pattern of variable-width bars and spaces which represents numeric or alphanumeric data in machine-readable form. The general format of a barcode symbol consists of a leading margin, start character, data or message character, check character (if any), stop character, and trailing margin. Within this framework, each recognizable symbology uses its own unique format.

Barcode Label

A label that carries a barcode and can be affixed to an article.

Baud Rate

A unit used to measure communications speed or data transfer rate.

EEPROM

Electrically Erasable Programmable Read-Only Memory. An on-board non-volatile memory chip.

Full Duplex

Simultaneous, two-way, independent transmission in both directions.

Host

A computer that serves other terminals in a network, providing services such as network control, database access, special programs, supervisory programs, or programming languages.

Interface

A shared boundary defined by common physical interconnection characteristics, signal characteristics and meanings of interchanged signals.

LED (Light Emitting Diode)

A low power electronic device that can serve as a visible or near infrared light source when voltage is applied continuously or in pulses. It is commonly used as an indicator light and uses less power than an incandescent light bulb but more than a Liquid Crystal Display (LCD). LEDs have extremely long lifetimes when properly operated.

Parameter

A value that you specify to a program. Typically parameters are set to configure a device to have particular operating characteristics.

Protocol

A formal set of conventions governing the formatting and relative timing of message exchange between two communicating systems.

RS232

Interface between data terminal equipment and data communication equipment employing serial binary data interchange.

RS485

Interface that specifies the electrical characteristics of generators and receivers for use in balanced digital multipoint systems such as on a Multidrop line.

Scanner

A device that examines a printed pattern (barcode) and either passes the uninterpreted data to a decoder or decodes the data and passes it onto the Host system.

Serial Port

An I/O port used to connect a scanner to your computer, identifiable by a 9-pin or 25-pin connector.

Signal

An impulse or fluctuating electrical quantity (i.e.: a voltage or current) the variations of which represent changes in information.

Symbol

A combination of characters including start/stop and checksum characters, as required, that form a complete scannable barcode.

Trigger Signal

A signal, typically provided by a photoelectric sensor or proximity switch, which informs the scanner of the presence of an object within its reading zone.

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