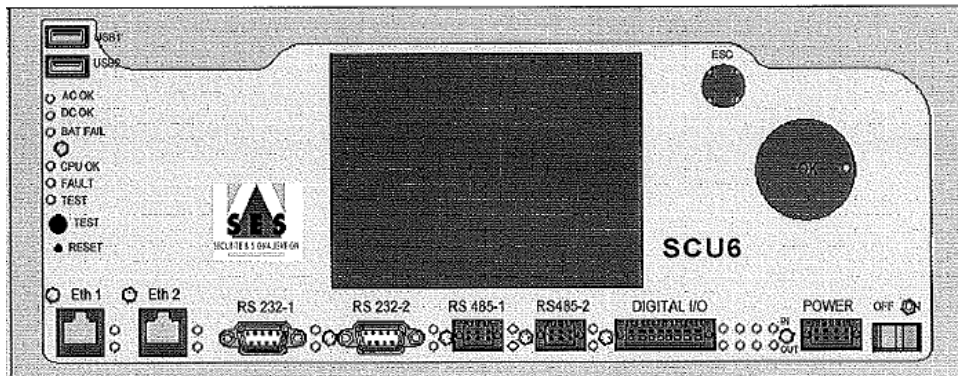




SCU6 DYNAMIC MESSAGE SIGN CONTROLLER TECHNICAL DESCRIPTION



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SES America, Inc.
90 Douglas Pike
Smithfield, RI 02917
Phone: (401) 232-370
Toll-free: (800) 252-6220
Fax: (401) 232-7130



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	Name	Company / Qualification	Date	Initials
Written by	Neil Tozier	SESA Engineering Manager	8/20/2008	
Approved by	Phil Perut	SESA Business Manager	8/22/2008	

Revision	Date	Modifications
-	8/22/2008	Initial Release
A	9/16/2008	Added front panel description



Purpose

The purpose of this document is to provide a brief description of the technical design aspects and features of the SCU6 DMS sign controller. The intent is to allow the reader to understand the most significant features and operational capabilities of the unit.

The SCU6 is designed to monitor and operate all types of SESA Messenger 6000 Dynamic Message Signs and all types of SESA LED Lane Control Signs.

Introduction

SES's SCU6 Controller is the sixth generation of a high-quality product that provides ease-of-use, ease-of-maintenance, expandability, and interchangeability. It is located at the top of the Controller Cabinet, for easy operation. It can also be installed within a DMS Walk-in housing.

Some key design points include:

- The main advantage of this controller is that it drives **all the sign components via an RS 485 network**. Therefore, all the components required to operate and monitor the sign (i.e., display boards, input/output boards, line drivers, etc.), are linked together on a single RS 485 bus.
- Fully complies with the National Transportation Communications for ITS Protocol (**NTCIP standard**), as well as other communication languages.
- All sign operating parameters, as well as the Controller's firmware, are stored in **Flash Memory**. This allows the individual characteristics of each sign to be easily changed in accordance with each client's needs.
- The controller uses "VX WORKS", the real-time operating system by Wind River, noted for its **reliability** and **stability**.

The SCU6 was designed from inception to operate in harsh environmental conditions and is therefore designed for:

- **Low power** consumption.
- **Low heat** dissipation – requiring no fans or blowers.
- **High** reliability.
- **Wide** operating temperature range (-34 F, +165 F)
- Meets or exceeds all **NEMA TS4 environmental** testing requirements, which include temperature and humidity cycles, vibration, shock, and electromagnetic compatibility.



Physical Description:

The SCU6 is housed in a lightweight 19-inch 3U chassis that is less than 3 inches deep!



SCU6 front panel, LCD screen and keypad



SCU6 top view

The front panel provides the following elements:

- **Two (2) Ethernet 10/100 full-duplex ports,**
- **Two (2) RS-232 serial ports,**
- **Two (2) RS-485 serial ports,**
- **Four (4) digital outputs,**
- **Four (4) digital inputs,**
- **Two (2) USB ports,**
- **One (1) reset push button,**

The internal single board computer has the following attributes:

- **Intel PCA PXA 255 processor,**
- **32-Megabytes of SDRAM,**
- **16-Megabytes of flash memory,**
- **Internal real time clock,**
- **Protocol: NTCIP, etc.**



All electrical connections between the SCU6 and subassemblies located within the Controller Cabinet or the DMS are achieved through the front panel to avoid maintenance access problems associated with connectors located at the rear of the controller. Variations in connector pinout and sex (male/female) are employed to prevent misplacement of the connectors.

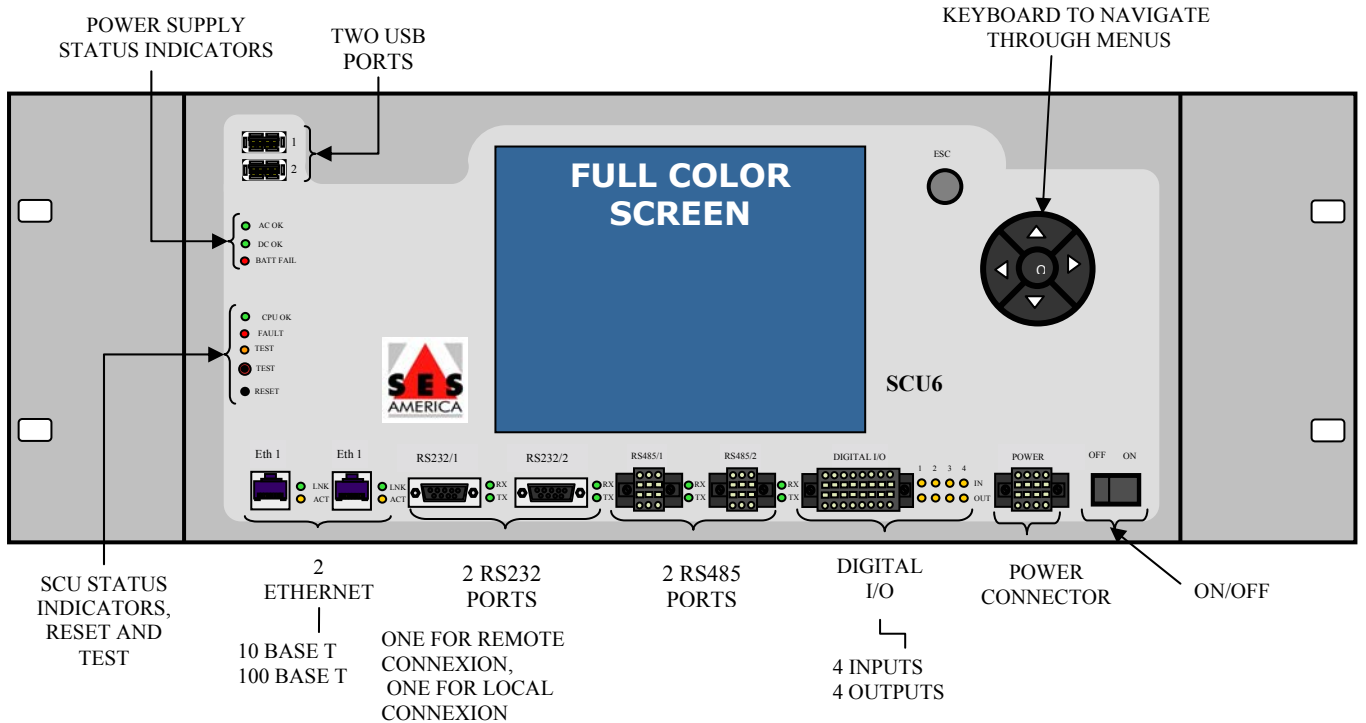
Sign Operation and Monitoring

The sign can be operated directly at the Controller Cabinet (or DMS housing) using the built-in full color LCD panel and keypad (or by connecting a laptop to one of the units RS 232 and Ethernet ports). The LCD screen uses an indicator icon to allow the operator to quickly determine overall sign status. If all systems are operating properly a green indicator is displayed, as shown in the sample display below.



General Status Display

The green indicator will be replaced with a yellow indicator if any system faults are detected, and the round keypad can then be used to navigate to more detailed information (such as the source of the fault, the type of the fault, the exact location of any malfunctioning pixels, etc.)



SCU6 front panel

Summary

The SCU6 provides the most up-to-date DMS controller capabilities in a small package that is reliable and virtually impossible to miswire. The internal control program provides the operator with easily recognizable status displays that include detailed information about the operation of all sign subsystems. It allows the operator access to all important sign functions through its RS-232 and Ethernet communication connectors. Finally, it is easy to update and modify to account for individual sign properties.