

2006Prog Rev. 1 User and Service Manual

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Overview:

The 2006Prog Rev. 1 is a compact, low-cost programmer for the Siemens® SDA-2006 EEPROM. The 2006 is a first-generation EEPROM requiring high voltage (+33V and +15V) for programming and reading and thus is not supported by commercial programmers. However, it was widely used in its day and thus a reliable method of reading and programming it is required for the maintenance of legacy equipment. For example, the SDA2006 is used to store the model differentiation and calibration data for the Sartorius® MP8 series of laboratory balances that are still widely used in laboratories around the world.

Installation

Preparing the 2006Prog for use:

- 1) Connect the DB9 RS-232 connector to a standard PC serial port using a DB9 male to DB9 female straight-through (not null-modem) cable.
- 2) Plug the included power adapter into a 120VAC electrical outlet.
- 3) Plug the included power adapter into the 2006Prog.
- 4) Insert the SDA2006 IC to be read or programmed into the programmer socket such that pin 1 of the IC is oriented toward the top of the programmer (the end with the power and RS-232 connectors.) Note that the 2006Prog includes no internal protection circuitry and thus the 2006Prog and/or the SDA-2006 IC may be damaged if the device is inserted backwards.

Using the 2006Prog with a standard terminal emulator

The 2006Prog is designed to allow use on any platform with a standard RS-232 port and terminal emulation software and does not require any special software or drivers. It has been tested in this mode with Minicom on Linux and Mac and with HyperTerminal on Microsoft® Windows® but should work with a wide variety of similar software. Furthermore, for ease of use a GUI based software driver package is provided. See the next section for usage directions for this GUI software.

To use the 2006Prog with a standard terminal emulator, configure the terminal emulator as follows:

```
BAUD: 9600
Data Bits: 8
Parity: None
Stop Bits: 1
Hardware Flow Control: Off
Software Flow Control: Off
```

When power is applied to the 2006Prog, the following text should appear:

```
2006Prog Rev. 1 SDA2006 EEPROM Reader and Programmer
(c)2012 Matthew D'Asaro under the terms of the GPL
Type 'h' for help
2006Prog>
```

This indicates that the 2006Prog is correctly connected and ready for use. If trouble is encountered, recheck the serial port settings and connections, then disconnect and reconnect power to the SDA2006 to reset it.

The 2006Prog accepts the following commands. Note that only the first letter of each command is used to differentiate it from other commands, so ‘e’ ‘erase’ and ‘elkfdgljhsq’ will all erase the EEPROM.

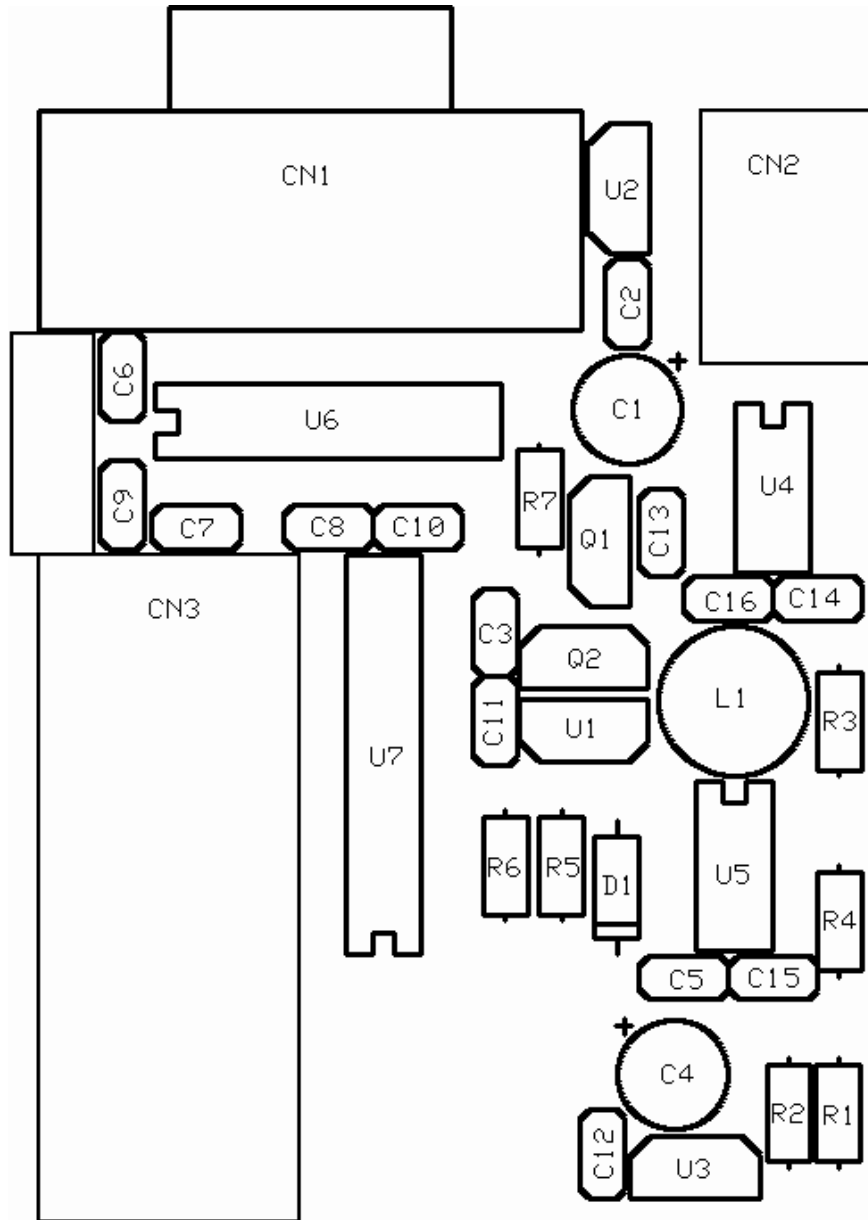
- ‘h’ or ‘help’ – Displays a list of commands and their function.
 - ‘r’ or ‘read’ – Reads the EEPROM and places its contents into the buffer.
 - ‘v’ or ‘verify’ – Verifies that the buffer contents match the EEPROM contents. In the event that they do not, the actual contents of the EEPROM are displayed. Note that this command does not modify the buffer contents in any way.
 - ‘p’ or ‘program’ – Programs the contents of the buffer into the EEPROM. Note that the 2801 does not need to be erased before programming. Verification that the EEPROM data matches the buffer after programming is not performed automatically.
 - ‘e’ or ‘erase’ – Erases the EEPROM, filling it with zeros. Note that this command does not modify the buffer contents in any way.
 - ‘d’ or ‘display’ – Displays the contents of the buffer on the screen in hexadecimal format.
 - ‘l’ or ‘load’ – Allows the buffer to be filled. Buffer contents are entered in hexadecimal starting with address zero. Invalid characters are ignored and when the buffer is full (32 bytes) this command exits and the prompt reappears. Note that text can be pasted into the terminal program from a file saved locally on the computer to load the buffer without manually typing the contents. However, be sure to configure the terminal program to allow a delay between bytes, as entering the data too fast will crash the microcontroller in the 2006Prog.
 - ‘c’ or ‘clear’ – Clears the buffer, filling it with all zeros.
 - ‘a’ or ‘automation’ – Enters automation mode. In this mode all commands are still accepted but entered characters are not echoed back. This mode is used by the GUI interface to directly control the 2006Prog. Exit this mode by resetting the system using the ESC key. Note that entering this mode preserves the buffer contents, but the buffer is cleared when this mode is exited.
- ESC – Pressing the ESC key at any time resets the system, clearing the buffer contents.

Using the 2006Prog with the *gEEProg* GUI interface

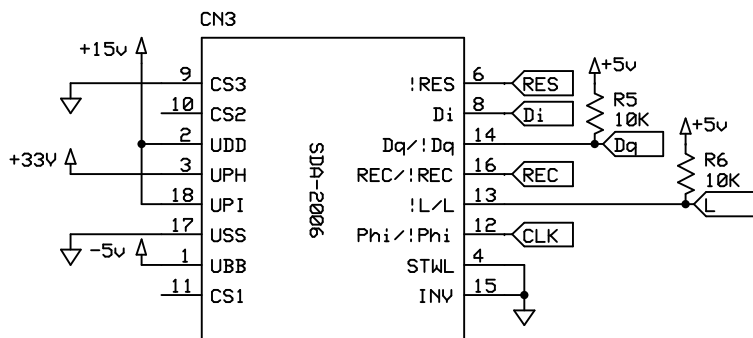
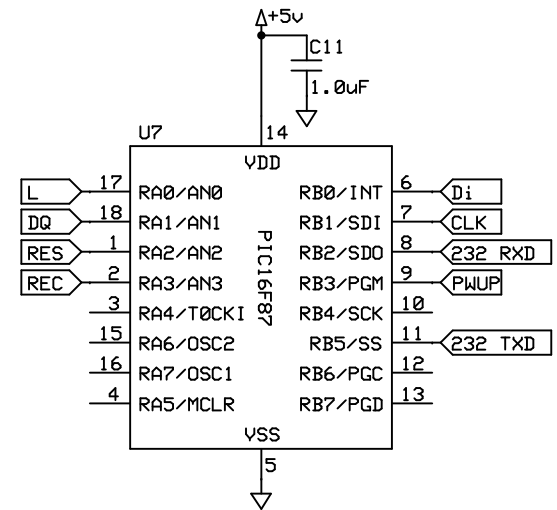
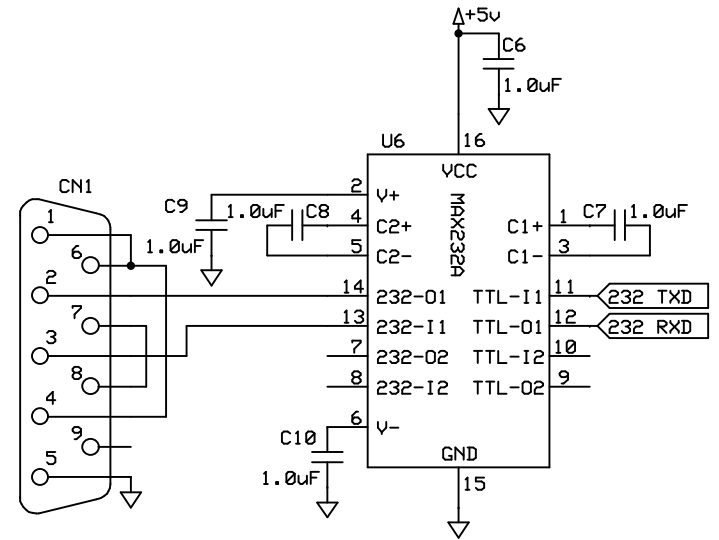
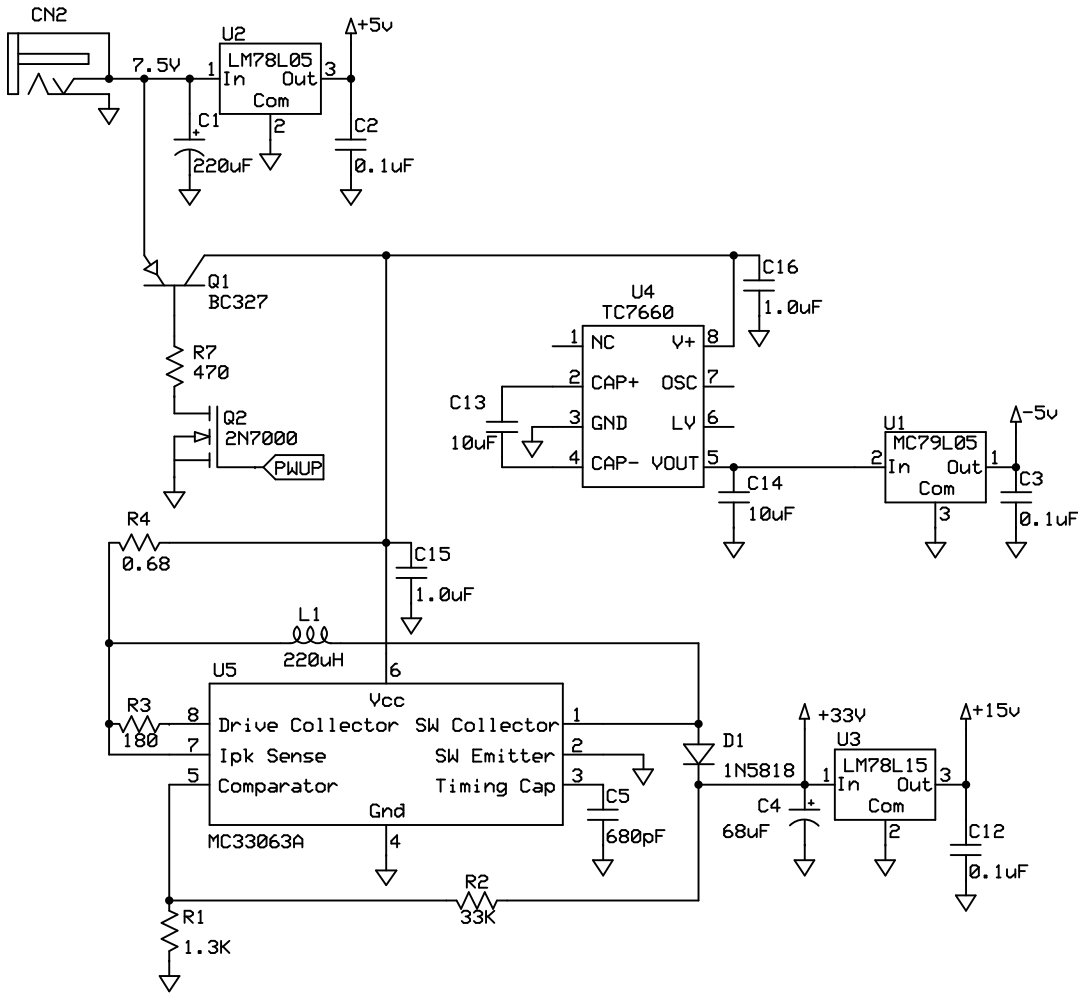
The open-source *gEEProg* application provides a graphical interface to all of the features of the 2006Prog as well as all other programmers sold by D’Asaro Designs. It is written in Python so as to be cross-platform and has been tested on Windows, Linux and OS X. Compiled applications are provided for both Windows and OS X. Please read the full *gEEProg* manual available at www.dasarodesigns.com for more information.

Servicing the Hardware

The 2006Prog Rev. 1 is designed for long life and built with only top-quality components. Furthermore, it is backed by a simple lifetime guarantee – if it ever fails, just return it for a free repair. However, in the event that field service is required, a component layout diagram, schematic, and a complete parts list are included on the following pages.



2006Prog Component Layout Diagram



2006Prog Rev. 1 Electrical Parts List, Page 1

Reference Designation	Quantity	Mfg.	Mfg. P/N	Mouser P/N	DigiKey P/N	Description / Notes
C1	1	Nichicon	UVZ1C221	647-UVZ1C221MED	493-1284-ND	220uF, 16V
C2 - C3, C12	2	Vishay	K104K15X7RF5TL2	594- K104K15X7RF5TL2	BC1084CT-ND	0.1uF, 50V
C4	1	Nichicon	UVY1H680MED	647-UVY1H680MED	UVY1H680MED- ND	68uF, 50V
C5	1	Vishay	K681K15X7RF5TL2	594- K681K15X7RF5TL2	BC1071TR-ND	680pF, 50V
C6 - C11, C15, C16	6	Vishay	K105Z20Y5VF5TL2	594- K105Z20Y5VF5TL2	BC1162CT-ND	1.0uF, 50V
C13 - C14	2	TDK	FK16X7R1C106K	810-FK16X7R1C106K	445-8348-ND	10uF, 16V
CN1	1	TE Connectivity	5747844-5	571-5747844-5	A32118-ND	DB-9 Female
CN2	1	Kobiconn	163-179PH-EX	163-179PH-EX	N/A	Power Connector 2.1mm x 5.5mm
CN3	1	N/A	N/A	OBD	OBD	18-pin zif socket.
D1	1	STMicroelectronics	1N5818	511-1N5818	497-4548-3-ND	Schottky Diode, 1A, 30V
L1	1	Bourns	RLB0914-221KL	652-RLB0914-221KL	RLB0914- 221KL-ND	Inductor, 220uH
Q1	1	Fairchild Semiconductor	2N7000	512-2N7000	2N7000FS-ND	NMOS, 60V, 200mA
Q2	1	Fairchild Semiconductor	BC327BU	512-BC327BU	BC327BU-ND	PNP, 45V, 800mA
R1	1	KOA Speer	MF1/4DC1301F	660-MF1/4DC1301F	OBD	1.3K, 1/4W 1% Metal Film
R2	1	KOA Speer	MF1/4DC3302F	660-MF1/4DC3302F	OBD	33K, 1/4W 1% Metal Film
R3	1	Xicon	291-180-RC	291-180-RC	OBD	180Ohms 1/4W 5% Carbon Film
R4	1	KOA Speer	CF1/4CR68J	660-CF1/4CR68J	OBD	0.68 Ohms 1/4W 5% Carbon Film
R5 - R6	2	Xicon	291-10K-RC	291-10K-RC	OBD	10K 1/4W 5% Carbon Film

2006Prog Rev. 1 Electrical Parts List, Page 2

Reference Designation	Quantity	Mfg.	Mfg. P/N	Mouser P/N	DigiKey P/N	Description / Notes
R7	1	Xicon	291-470-RC	291-470-RC	OBD	470 Ohms 1/4W 5% Carbon Film
U1	1	TI	MC79L05ACLPE3	595-MC79L05ACLPE3	296-9603-5-ND	-5V Linear Regulator
U2	1	TI	LM78L05ACZ/NOPB	926- LM78L05ACZ/NOPB	LM78L05ACZNS/ NOPB-ND	+5V Linear Regulator
U3	1	TI	LM78L15ACZ/NOPB	926- LM78L15ACZ/NOPB	LM78L15ACZ/NO PB-ND	+15V Linear Regulator
U4	1	Microchip	TC7660EPA	579-TC7660EPA	TC7660EPA-ND	Charge Pump IC
U5	1	TI	MC33063AP	595-MC33063AP	296-17764-5- ND	Switching Regulator Controller
U6	1	TI	MAX232NE4	595-MAX232NE4	296-1402-5-ND	TTL to RS232 Converter
U7	1	Microchip	PIC16F87-I/P	579-PIC16F87-I/P	PIC16F87-I/P- ND	Microcontoller
N/A	1	TE Connectivity	1-390261-5	571-1-390261-5	A100207-ND	Chip socket for U7
N/A	1	Triad Magnetics	WSU075-1000	553-WSU075-1000	237-1423-ND	7.5VDC, 1000mA Power Supply
N/A	1	Generic	N/A	N/A	N/A	DB9-M to DB9-F straight- through cable