Agilent 35900E Series II

Dual Channel Interface

User Manual

Agilent Technologies

Notices

Warranty

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Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Contents

1

Introduction

The Agilent 35900E Series II Dual Channel Interface (35900E Series II) is a dual-channel, run-buffered interface that connects analytical instruments to Agilent data systems. It converts the analog signal from analytical instruments to digital data and transmits it to the host computer for further processing. The 35900E Series II is intended for use with both Agilent and non-Agilent manufactured laboratory instruments with a two-dimensional analog output.

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Features

The 35900E Series II (Figure 1) features include the following:

- Data buffering
- Two independent analog-to-digital (A/D) converters, or dual channel synchronous
- Real-time control
- Instrument control ports
- Host communication
- Front panel indicators that show run status, interface activity, etc.
- External power adaptor with 24 DC output

On/Off Switch
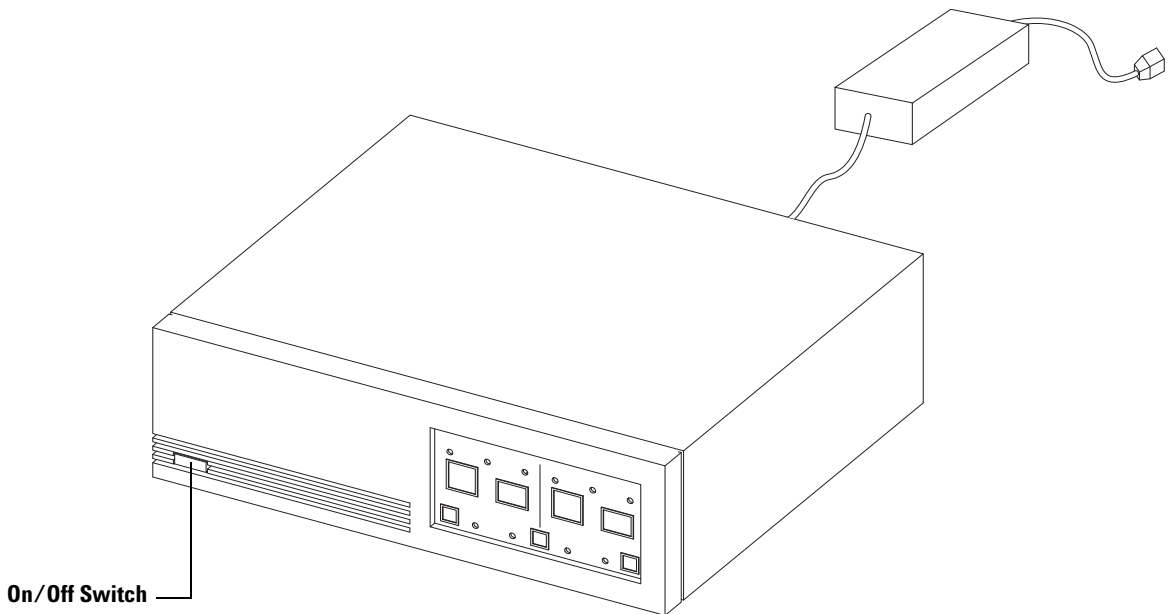
Figure 1   Agilent 35900E Series II Dual Channel Interface

Independent Analog-to-Digital Converters

The analog-to-digital channels provide 24-bit analog-to-digital conversion of up to two independent analog signals. The analog inputs can either be asynchronous (have no relationship at all to each other) or synchronous (separate signals, but logically related to the same **START** reference). To allow asynchronous operation, each channel has separate Start/Stop switches, status indicators, and controllable digital I/O. The analog input signal is digitized by a continuously integrating A/D converter. This means that the input signal is continuously applied to the converter's input, and because of that, no portion of the signal is ever lost due to input multiplexing or the sampling process.

Real-Time Control

The 35900E Series II provides a set of real-time control functions for a host computer system. These can be separated into two groups:

- Remote Control Bus
- Digital (TTL I/O) Ports

Remote Control Bus

The Remote Control Bus is a hardware interface that provides a set of defined signals most frequently encountered in the laboratory environment. These signals include **START**, **STOP**, **READY** and **START REQUEST**. The 35900E Series II has one Remote Bus per channel to allow for asynchronous operation. These connectors are 9-pin "D-Type" female connectors each having eight bidirectional (input/output) signals.

Digital (TTL I/O) ports

Each channel has a dedicated TTL I/O connector with 16 signal lines. Of the 16, eight are bidirectional (configurable as inputs or outputs for such functions as valve control) and the remaining eight lines are input-only signals (for such functions as bottle numbers).

Instrument Control Ports

There are two RS-232 ports (one for each channel) that may be used to communicate with RS-232 compatible lab instruments such as certain autosamplers, balances, or GCs.

Line protocols and operating modes for RS-232 communication are configured via commands from the host computer.

Host Computer Communication

The 35900E Series II has built-in RS-232 and LAN (TCP/IP) ports for host communications.

Front Panel

The front panel of the 35900E Series II has two buttons and three LED (light emitting diodes) indicators for each channel. There are also four indicator LED indicators at the bottom of the panel to convey general information about the state of the 35900E Series II interface.

Start/Stop push buttons

Each channel has **START** and **STOP** push buttons that may be used to manually start and stop analytical runs. These push buttons can be individually enabled or disabled by the host computer software controlling the 35900E Series II.

Run status indicators

Each channel has three LED indicators.

READY—Indicates there is no current activity on the channel and it is ready to begin a chromatographic run.

RUN—This light indicates a run is in progress on that channel.

NOT READY—This light indicates the channel cannot start another run until other events are completed.

Hardware monitoring indicators

There are four LED indicators on the bottom of the front panel that display the status of the 35900E Series II.

Table 1   LED monitoring indicators for the 35900 Series II

LED Indicator	LED Color	Description
ACTIVE	Yellow	Indicates that there is data present in the interface that will be lost if the 35900E Series II's power is turned off.
COMM	Yellow	Indicates that the 35900E Series II is communicating with the host computer.
FAULT	Solid Red	Indicates that a nonrecoverable error occurred.
FAULT	Blinking Red	Indicates that the 35900 Series II is configured to use DHCP, but has not received an IP address. The red LED blinks about once per second.
POWER	Green	Indicates that power is applied to the instrument and that the on/off switch is turned on.

Important Safety Warnings

Before moving on, there are several important safety notices that you should always keep in mind when using the 35900E Series II.

WARNING   **If the power cord insulation is cut or worn, the cord must be replaced. Contact your Agilent service representative.**

Electrostatic discharge is a threat to 35900E Series II electronics

The printed circuit (PC) boards in the 35900E Series II can be damaged by electrostatic discharge. Do not touch any of the boards unless it is absolutely necessary. If you must handle them, wear a grounded wrist strap and take other anti-static precautions. Wear a grounded wrist strap any time you must access the 35900E Series II internal components.

Safety and Regulatory Certifications

The Agilent 35900E Series II Dual Channel Interface conforms to the following safety standards:

- International Electrotechnical Commission (IEC): 61010–1
- EuroNorm (EN): 61010–1

The Agilent 35900E Series II Dual Channel Interface conforms to the following regulations
on Electromagnetic Compatibility (EMC) and Radio Frequency Interference (RFI):

- CISPR 11/EN 55011: Group 1, Class A
- IEC/EN 61326
- AUS/NZ ⚡

This ISM device complies with Canadian ICES- 001. Cet appareil ISM est conforme a la norme NMB–001 du Canada.

$\boxed{C\,E}$

The Agilent 35900E Series II Dual Channel Interface is designed and manufactured under a quality system registered to ISO 9001.

Information

The Agilent 35900E Series II Dual Channel Interface meets the following IEC (International Electro- technical Commission) classifications:

Equipment Class III, Laboratory Equipment Installation Category II, Pollution Degree 2. Excludes the power adaptor which is ground protected.

This unit has been designed and tested in accordance with recognized safety standards and is designed for use indoors. If the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired. Whenever the safety protection of the Agilent 35900E Series II Dual Channel Interface has been compromised, disconnect the unit from all power sources and secure the unit against unintended operation.

Symbols

Warnings in the manual or on the instrument must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions violates safety standards of design and the intended use of the instrument. Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

See accompanying instructions for more information.

Indicates a hot surface.

Indicates hazardous voltages.

Indicates earth (ground) terminal.

Indicates electrostatic discharge hazard.

Indicates that you must not discard this electrical/electronic product in domestic household waste.

Electromagnetic compatibility

This device complies with the requirements of CISPR 11. Operation is subject to the following two conditions:

• This device may not cause harmful interference.

• This device must accept any interference received, including interference that may cause undesired operation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

1 Relocate the radio or antenna.

2 Move the device away from the radio or television.

3 Plug the device into a different electrical outlet, so that the device and the radio or television are on separate electrical circuits.

4 Make sure that all peripheral devices are also certified.

5 Make sure that appropriate cables are used to connect the device to peripheral equipment.

6 Consult your equipment dealer, Agilent Technologies, or an experienced technician for assistance.

Changes or modifications not expressly approved by Agilent Technologies could void the user's authority to operate the equipment.

Cleaning

To clean the unit, disconnect the power and wipe down with a damp, lint-free cloth.

Recycling the Product

For recycling, contact your local Agilent sales office.

1 **Introduction**

2

Setup

This section provides procedures for unpacking and configuring the 35900E Series II.

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To Unpack the Unit

1 If the 35900E Series II is purchased as part of a system, check the carrier's papers to verify that you received all containers.

2 Inspect the shipping container for damage and watermarks.

3 Remove the cables and documentation from the shipping container and set them aside.

4 Unpack the 35900E Series II and inspect it for damage. If you see damage, keep the carton and all packing materials for the carrier's inspection. Contact your nearest Agilent Technologies Sales and Service Office immediately.

Checking Parts and Accessories

1 Verify that you have all parts on the packing list. If you suspect that an option, accessory, or part is missing or incorrect, call your nearest Agilent Technologies Sales and Service Office immediately.

2 Store user information in a safe place.

Line Voltage

The external power adaptor of the 35900E Series II has a universal input range for line voltage and can be safely connected between 100 Vac and 240 Vac power sources.

Configuration Switch

There is a set of 6 configuration switches on the rear panel that control 35900E Series II operation. The default settings are shown in Figure 2. Table 2 describes the individual switch settings.
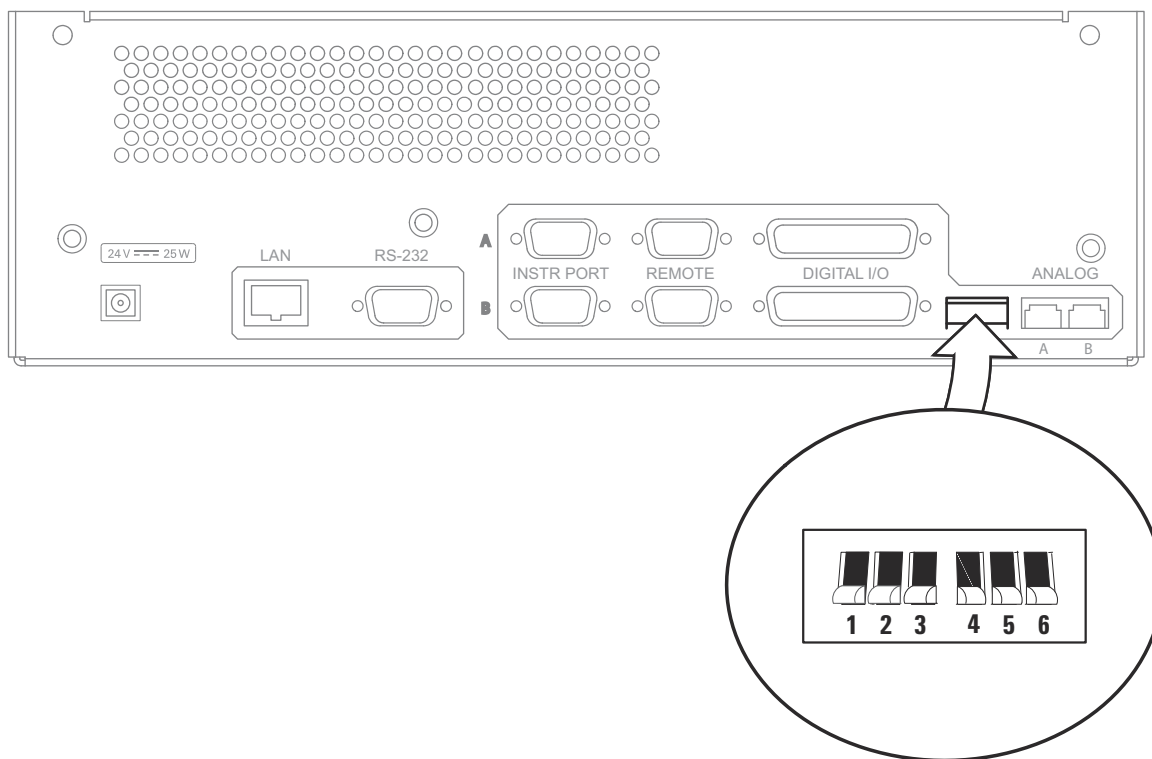

Figure 2   Configuration switch and default settings

Table 2   Configuration switch settings

Switch	Function	Position	Effect
1	Beep/Off	Up	Causes an audible beep when Start/Stop is pressed.
		Down	Silent at Start/Stop.
2	HI/LO	Up	Beep, if any, is loud.
		Down	Beep, if any, is soft.
3	Channel A - TEST/NORM	Up	Selects stored test chromatogram. Analog input signal ignored.
		Down	Selects Analog input for Normal Operation.
4	Channel A - ADD/IGNORE	Up	Add signal input to the stored chromatogram. Switch 3 must be in Up position.
		Down	Do not add (ignore) signal input to stored chromatogram for Channel A.
5	Channel B - TEST/NORM	Up	Selects stored test chromatogram. Analog input signal ignored.
		Down	Selects Analog input for Normal Operation.
6	Channel B- ADD/IGNORE	Up	Add Channel B signal input to the stored chromatogram. Switch 5 must be in Up position.
		Down	Do not add (ignore) signal input to stored chromatogram for Channel B.

Switches 1 and 2 affect the beeper operation.

The remaining switches combine to specify either a test mode or normal operation for each channel. The test mode provides service technicians with a diagnostic tool to show the effects of electrical noise on a known test signal.

Switches 3 and 4 combine to specify either a test mode or normal operation mode for Signal A.

Switches 5 and 6 combine to specify either a test mode or normal operation mode for Signal B.

3
Computer Connection

The 35900E Series II supports TCP/IP LAN (network) and RS-232 connection types for host computer communications.

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Connecting to a TCP/IP Network

The TCP/IP in the 35900E Series II has Ethernet IEEE 802.3 connector type RJ-45 (twisted-pair cable). Before connecting the 35900E Series II to the network, the network must be operational. Connect a LAN cable (part number 8121-0940) to both the 35900E Series II and network before turning on the 35900E Series II.
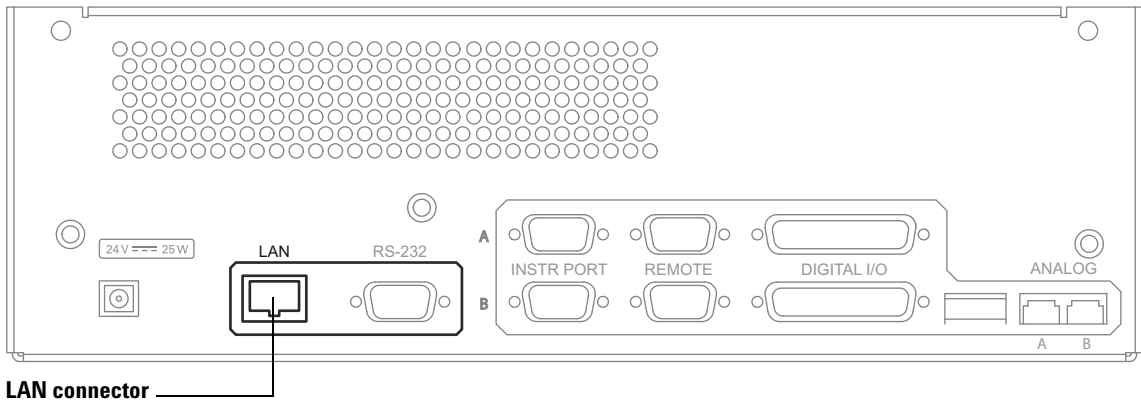

LAN connector

Figure 3   Network connection

To communicate with the 35900E Series II, you must assign it an IP address compatible with the site LAN. The 35900E Series II must receive its address from either a BootP server/service or DHCP server.

For more information on installing and using a BootP server/service, refer to your Agilent data system instructions.

Restore the default IP address and turn off DHCP

To restore the factory default IP address and turn off DHCP:

1 Turn off the instrument.

2 While pressing and holding the **START** key, turn on the instrument. Hold the **START** until you hear two beeps (several seconds). The green **POWER** LED will be the only front panel LED illuminated.

3 Turn off the instrument.

4 Power on the instrument a second time. After a single beep the default IP is enabled and DHCP is turned off.

IP address	192.168.254.11
Gateway	0.0.0.0
Subnet	255.255.255.0
DHCP	FALSE

Restore default IP address for DHCP

If using DHCP to set the instrument IP address, you can restore the default IP address and enable DHCP as follows:

1 Turn off the instrument.

2 While pressing and holding the **STOP** key, turn on the instrument. Hold the **STOP** until you hear two beeps (several seconds). The green **POWER** LED will be the only front panel LED illuminated.

3 Turn off the instrument.

4 Power on the instrument a second time. After a single beep the default IP is enabled and DHCP is turned on.

IP address	0.0.0.0
Gateway	0.0.0.0
Subnet	255.255.255.0
DHCP	TRUE

NOTE If the red **FAULT** LED blinks about once per second, the 35900 Series II is configured for DHCP and the external computer (DHCP server) has not provided an IP address.

Configuring an RS-232 Connection

The 35900E Series II has a RS-232 connection used to communicate with the host computer. Review your data system's installation instructions to determine compatibility.

The RS-232 connection has a single 8-position configuration switch on the inside of the 35900E Series II (see Figure 4).
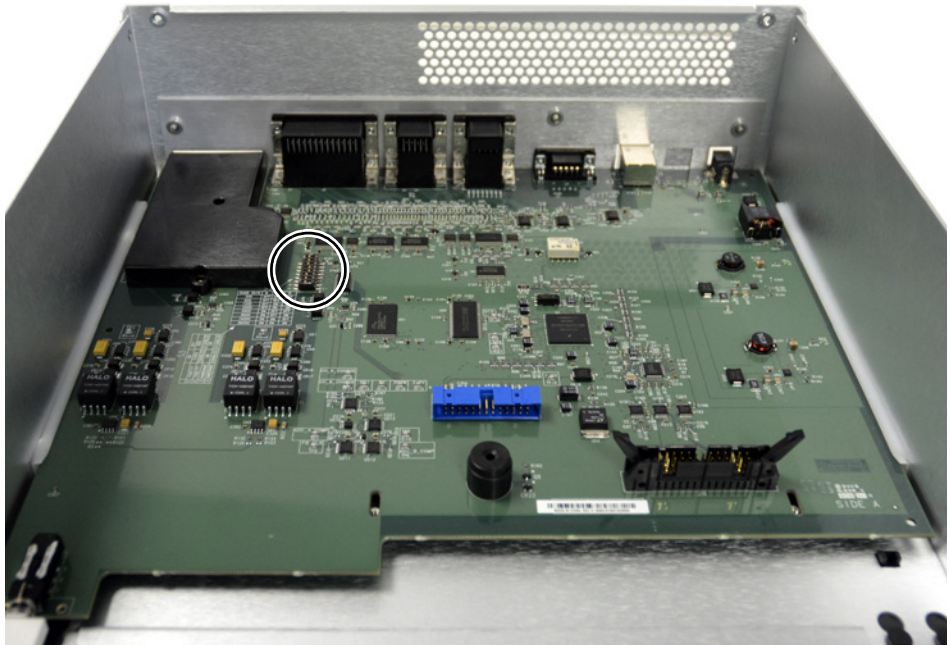

Figure 4   Switch location on main board

To access the 8-position configuration switch, you must remove the top cover. See "Remove the Top Cover" on page 44 for steps.

Be sure to wear a grounded electrostatic wrist strap when accessing the 8-position configuration switch to avoid causing damage to the main board.

Once you have removed the top cover, set switch position 1 ON to enable communication mode. In this mode, the ON switch positions for switches 2-8 are defined in Table 3.

Table 3   RS-232 communication mode

Switch	ON Action
2	Handshake enabled
3	Hardware handshake (otherwise software handshake)
4	Parity enable
5	Even parity (otherwise odd parity)
6, 7, 8	Baud rate (see Table 4)

An example jumper setting for this switch is shown in Figure 5.
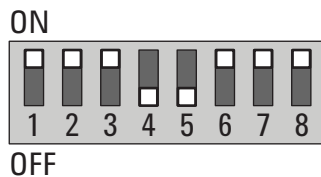
Figure 5   Example jumper settings for RS-232

When switch 1 is set to the ON position, RS-232 port is activated. Switch 2 set to ON indicates that handshaking is enabled. With handshake enabled, switch 3 set to OFF indicates software handshaking. Switch 4 set to ON enables parity checking. Switch 5 set to OFF indicates odd parity.

Switches 6 through 8 combine to indicate baud rate. See Table 4 for switch settings and their corresponding baud rates. Switches 6 and 8 set to ON and 7 set to OFF combine to form a RS-232 baud rate of 9600 as shown in Table 4.

Table 4 Example settings for RS-232 baud rates

	Switch		
Baud rate	6	7	8
300	OFF	OFF	OFF
600	OFF	OFF	ON
1200	OFF	ON	OFF
2400	OFF	ON	ON
4800	ON	OFF	OFF
9600	ON	OFF	ON
19,200	ON	ON	OFF
38,400	ON	ON	ON

Install the top cover when finished.

Connecting to a Host Computer Using RS-232 Communications

Use the RS-232 connection when the host computer uses this protocol.

To connect a TCP/IP host connection, see "Connecting to a TCP/IP Network" on page 22.

Only one host connection can be made to a host computer at a time.

To connect RS-232 communications

1 Power off the 35900E Series II and the host computer.

2 Connect one end of the cable to the RS-232 connector shown in Figure 6.
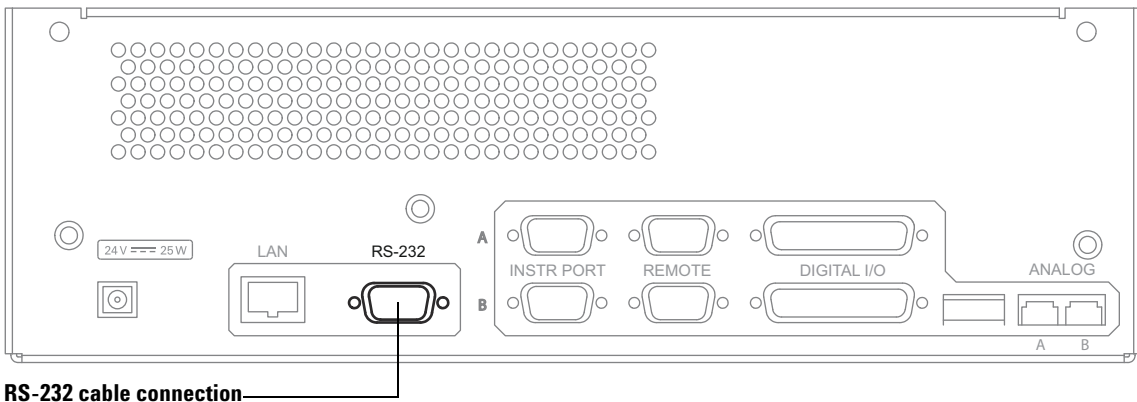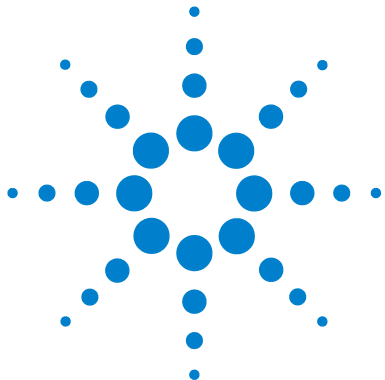

RS-232 cable connection

Figure 6   RS-232 cable connection

3 Connect the other end of this cable to the matching connector on the host computer.

3 **Computer Connection**

4

Instrument Connection

This section provides the analog signal, remote control, digital, and instrument control port connections available for the 35900E Series II.

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Analog Input (Signal) Connection

The signal must be within the range of - 18 millivolts to 1 volt. A simple voltage divider resistor network may be used to attenuate larger signals to this range. Each input has three pins to which the high (+) and low (−) sides of the signal and the shield are connected.

Use an instrument- specific cable (Table 5) whenever possible. Use a general purpose cable in those cases where a custom cable is not available. Appendix A lists pin assignments for all open cables.

1 Turn off the power to the instrument supplying the analog output signal.

2 **For instrument- specific cables–**Connect one end of the cable to the instrument's analog output using the instrument manufacturer's instructions.

CAUTION	For correct operation of the 35900E Series II, the input voltage must be in the range of -18 mV to +1 V. Voltages below −10 V or above +10 V may damage the instrument.

For general purpose cables–Use the pin assignments shown in Appendix A, "Cables" and the instrument manufacturer's instructions to connect the two signal wires and ground to the instrument.

3 Connect the cable to the appropriate (A or B) analog input on the rear panel of the 35900E Series II (Figure 7).

4 If needed, repeat for the other channel.
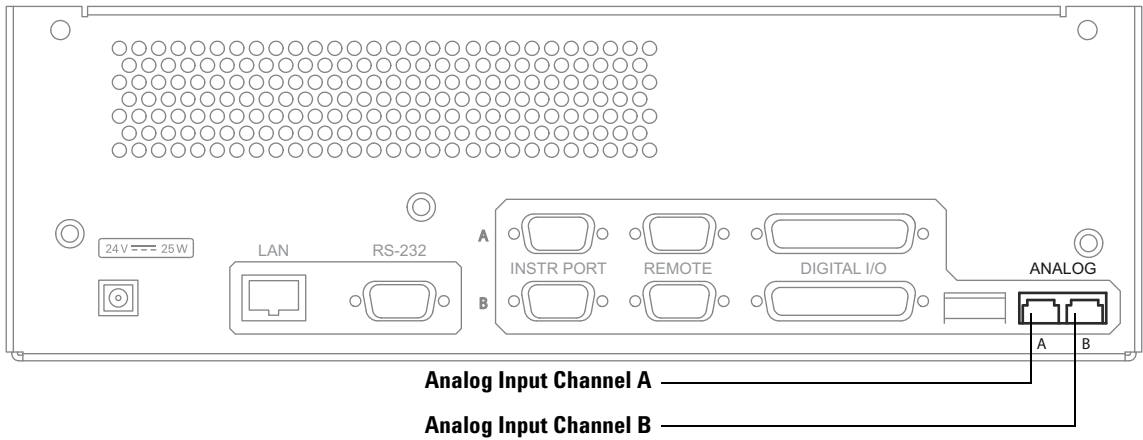
Figure 7 Analog Input (signal) connections

Table 5 Analog signal cables

Part no.	Description	Refer to
G1530-60570	6890/6850 Gas Chromatograph (GC), 6-pin (2 m)	Figure 17 on page 54
35900-60570	5880 GC	Figure 18 on page 54
35900-60630	General purpose spade lugs (12 m)	Figure 17 on page 54
35900-60900	General purpose spade lugs (5 m)	Figure 17 on page 54
35900-60910	General purpose spade lugs (15 m)	Figure 17 on page 54
35900-60610	5890A GC	
35900-60640	Special-purpose square pin	Figure 19 on page 55
35900-60750	1050 and 1046A Fluorescence detector	Figure 18 on page 54

Remote Control Connection

For remote control connection (Figure 8) use an instrument-specific cable whenever possible. Use a general purpose cable for equipment not listed in Table 6. Appendix A lists pin assignments for all open cables.
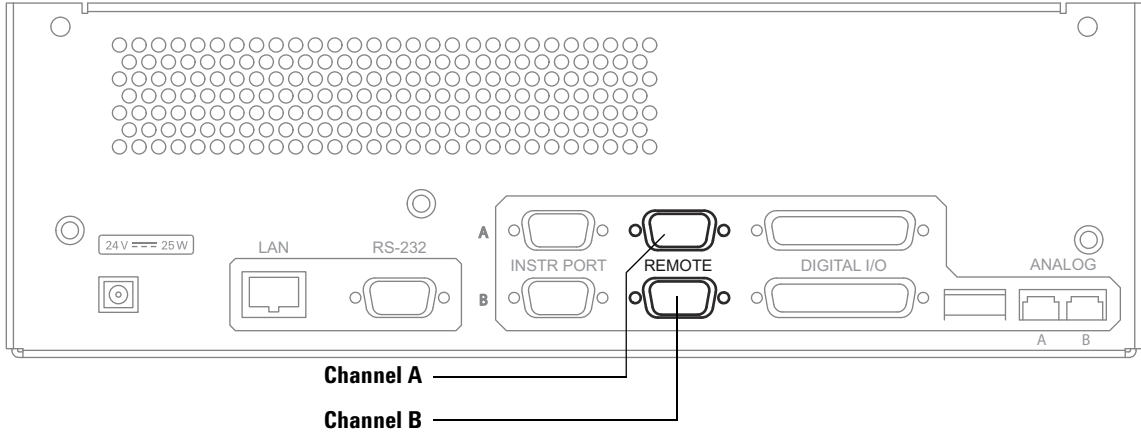
Figure 8   Remote control connection

Table 6   Remote control cables

Part no.	Description
35900-60610	5890 Remote signal cable
35900-60700	5890 GC Remote cable
35900-60920	Remote Start/Stop cable
35900-60970	5890/7673 Remote Y cable
35900-60980	5890/7673 Remote Y cable
G1512-60530	G1512A/5890A, APG, Remote Y cable
G1530-60930	6890/6850 GC Remote, 9-pin male/9-pin male

Table 7   Communication cable

Part no.	Description
G1530-60600	RS-232, 9-pin female/9-pin female

1 Turn off the power to both the 35900E Series II and the instrument containing the remote start/stop contacts.

2 **For instrument-specific cables–**Connect one end of the cable to the instrument's remote control connector using the instrument manufacturer's instructions.

For general purpose cables–Use the pin assignments shown in Figure 20 on page 56, and the instrument manufacturer's instructions to connect the wires to the instrument's remote control contacts. See also Table 8 on page 34. The following notes apply to a general purpose connection:

START and **STOP** lines are used for both input and output. As input, a 10 ms or longer pulse of TTL low(<0.8 V) is required. As output, a 120 ms TTL low pulse is sent.

READY line is both input and output. TTL low indicates not ready.

POWER ON line is shorted to ground when power is off. It is TTL high (>2 V) when power is on.

3 Connect the cable to the appropriate (A or B) remote control connector on the rear of the 35900E Series II.

4 If needed, repeat for the other channel.

Table 8 Remote control bus pin definitions

Pin	Signal name	Description
1	Digital Ground	
2	Prepare[*]	Pulsed low to request prepare for analysis (for example calibrate detector, turn on LED, etc.).
3	Start*	Pulsed low to signal that run has started (begin integration, temperature program, etc.).
4	Shut Down	Low level indicates that system has a serious problem (for example leak: stop pump).
5	Reserved	
6	Power On	High level indicates that all instruments connected to the system are switched on.
7	Ready	High level indicates that system is ready for next analysis (sequence may continue).
8	Stop*	Pulsed low to signal end of run: all modules should go to ready state as soon as possible.
9	Start Request*	Pulsed low to request start of injection cycle (autosampler signals START at time of injection).

[*] Input signals must be TTL low pulses (or contact closures to ground) with a duration of at least 10 ms; output signals are TTL low pulses with a duration of approximately 120 ms.

Digital I/O Connection

Each channel has a 25 pin female connector with 16 signal lines. Of the 16, eight are bidirectional input/output signals (for such functions as valve control) and the remaining eight lines are input-only signals (for such functions as reading bottle-number inputs). A "Y" adaptor cable (Figure 9) is available to route the 16 digital I/O signals to two 9-pin connectors. This cable takes the wires from the 8 digital I/O signals in the 25 pin connector and routes them to the 9 pin female connector labeled "A", and the 8 digital input only signals and routes them to the 9 pin female connector labeled "B". Use an instrument-specific cable whenever possible. Use a general purpose cable for equipment not listed in Table 9 or Table 10. Appendix A lists pin assignments for all open cables.

1 Turn off the power to both the 35900E Series II and the instrument containing the digital I/O connections.

2 Attach the "Y" adaptor cable's 25 pin connector labeled "C" to the appropriate channel's digital I/O connector on the rear of the 35900E Series II.

3 **For instrument-specific cables—**Connect one end of the cable to the instrument's digital I/O connector using the instrument manufacturer's instructions.

   For general purpose cables—Use the pin assignments shown in Appendix A for connector "A" or "B", and follow the instrument manufacturer's instructions to connect to the instrument's digital I/O.

4 Connect each instrument's digital I/O cables to the "Y" adaptor cable's "A" and "B" 9 pin female connectors. Note that the "Y" cables "B" connector is for bottle number type digital input and its "A" connector is for digital I/O used to control relays.

5 If needed, repeat for the other channel.

Figure 9   Digital I/O cables
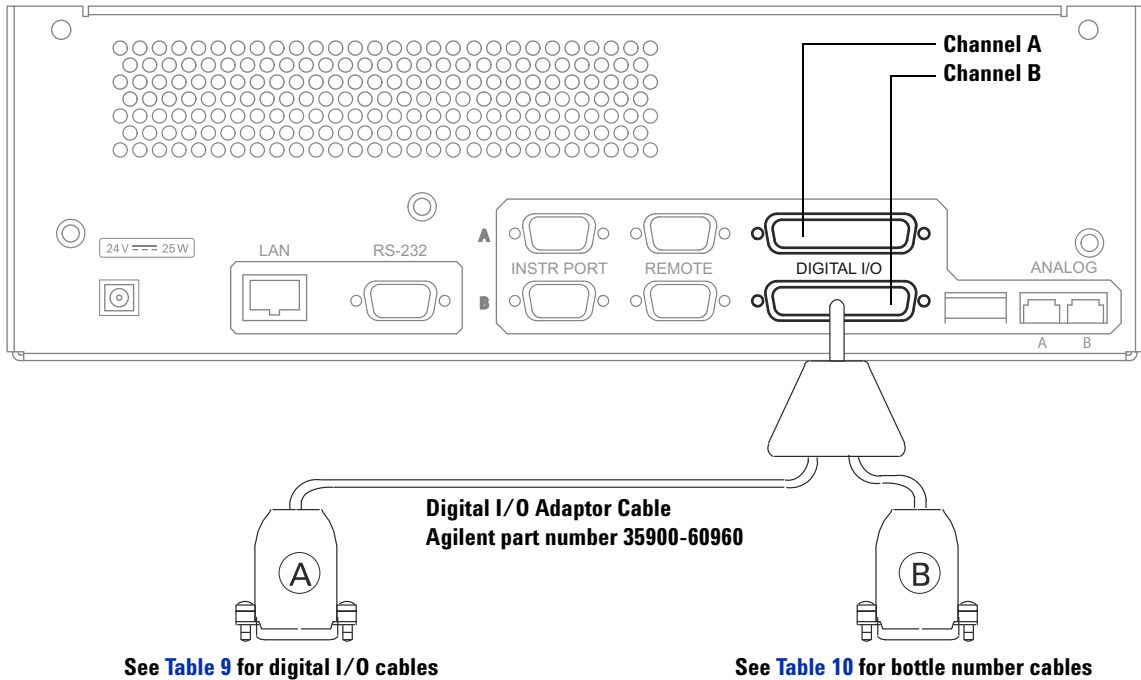
Table 9   Digital I/O cables

Part no.	Description	Refer to
35900-60670	General purpose spade lugs (2 m)	Figure 20 on page 56
35900-60920	General purpose spade lugs (5 m)	Figure 20 on page 56

Table 10   Bottle number cables

Part no.	Description	Refer to
35900-60670	General purpose spade lugs (2 m)	Figure 22 on page 58
35900-60920	General purpose spade lugs (5 m)	Figure 22 on page 58

Use an instrument-specific cable whenever possible. Use a general purpose cable for equipment not listed in Table 9 or Table 10. Appendix A lists pin assignments for all open cables.

1 Turn off the power to both the 35900E Series II and the instrument containing the digital I/O connections.

2 Attach the "Y" adaptor cable's 25 pin connector labeled "C" to the appropriate channel's digital I/O connector on the rear of the 35900E Series II.

3 **For instrument-specific cables—**Connect one end of the cable to the instrument's digital I/O connector using the instrument manufacturer's instructions.

   For general purpose cables—Use the pin assignments shown in Appendix A for connector "A" or "B", and follow the instrument manufacturer's instructions to connect to the instrument's digital I/O.

4 Connect each instrument's digital I/O cables to the "Y" adaptor cable's "A" and "B" 9 pin female connectors. Note that the "Y" cables "B" connector is for bottle number type digital input and its "A" connector is for digital I/O used to control relays.

5 If needed, repeat for the other channel.

Instrument Control Port Connection

Use part number 35900-60980 for RS-232C communication to a 5890 GC or 7673 Sampler. Attach one end of the RS-232C cable to the channel A or B instrument port and the other end to the instrument.
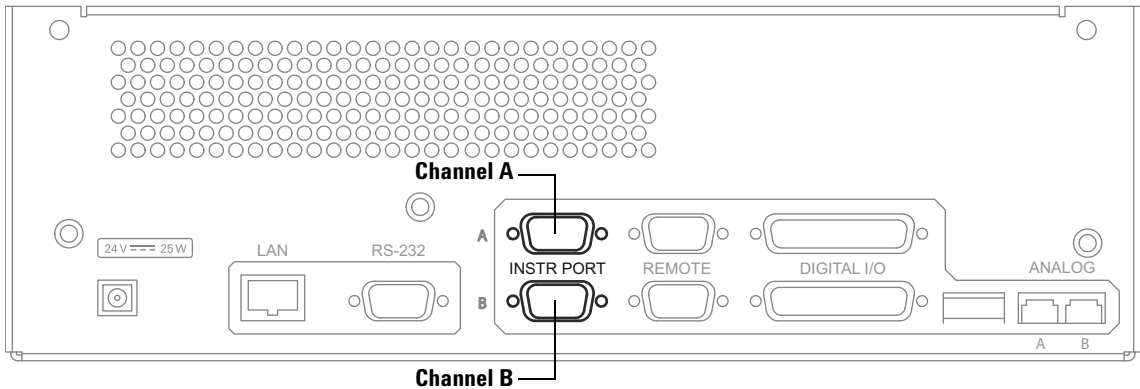

Figure 10   RS–232C connection for Instrument control

5

Startup

This section provides steps to verify the 35900E Series II is ready for operation.

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Pre-Run Checklist

Before using the 35900E Series II with the operating software on the host computer, make sure you have completed the following:

❏ Rear Panel configuration switches 3 through 6 are DOWN (normal operation)

❏ RS-232 or LAN connection is correctly configured for host computer communications

❏ RS-232 or LAN cable connected to host computer or network

❏ Analog signal cables connected

❏ Remote control cables connected (if needed)

❏ Digital I/O cables connected (if needed)

❏ Power cord connected

35900E Series II Power Up

WARNING   **The power cord must be connected to an outlet with a protective earth contact to ground the unit and minimize shock hazard.**

Power up the 35900E Series II by pressing the on/off switch (lower left corner of the front panel).

• All indicators should turn off, except for **POWER** (on steadily).

• Some other indicators may turn on, depending on the instrument configuration.

Verify 35900E Series II is Ready for Operation

At power up, the 35900E Series II automatically executes internal self-tests to determine that everything is operating properly. These tests take about one second.

When the 35900E Series II has completed the internal self-tests, verify that:

- The **FAULT** LED is OFF.
- The **POWER** LED is ON.
- No other indicators are blinking.

If the red **FAULT** LED is blinking about once per second, the 35900 Series II is configured for DHCP and the external computer has not provided an IP address. Check the external networking procedures (See "Restore default IP address for DHCP" on page 23).

You can use the test chromatogram stored in the 35900E Series II ROM in conjunction with the host computer software to check the operation of the entire system. The test chromatogram is turned on via configuration switches 3 through 6 on the 35900E Series II's back panel.

In Case of Difficulty

If the 35900E Series II does not power up correctly, power off the 35900E Series II and disconnect all communication and signal cables. With only the power cable connected, turn the power back on.

- If the 35900E Series II powered on correctly:

  a Power off the 35900E Series II.

  b Reconnect one communication or signal cable.

  c Power on the 35900E Series II.

  If the 35900E Series II powers on correctly, repeat the steps above for each cable until you find the cable that causes the failure. Replace the cable.

- If the problem persists after cycling the power, note the LED pattern on the front panel display. Check Table 11 for possible causes for failure. If the fault condition persists, contact Agilent for service.

Table 11   Possible causes for failure

Condition	Possible causes
POWER LED is OFF	Power cord is disconnected or problem with the power supply
FAULT LED remains ON and **COMM** LED is flashing (note: other LED indicators may also be flashing)	Problem with a cable connector
FAULT LED blinks red about once per second.	The 35900E Series II is set to use DHCP, but the external computer (DHCP server) did not provide an IP address. Power cycle. Check LAN and the DHCP server.
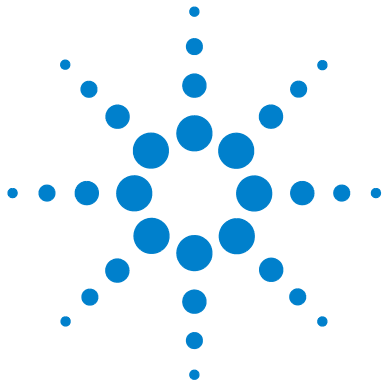
6

Parts Replacement

This section lists the replaceable parts of the 35900E Series II and provides replacement procedures.

The procedures in this section are intended for use by Agilent-trained service personnel only. There are no user-serviceable parts inside the 35900E Series II.

The 35900E Series II was designed for easy assembly and disassembly of all the replaceable modules. The only tool needed for this process is a PoziDriv screwdriver No. 2 Pt (part number 8710-0900).

All electronic assemblies and parts should be handled with proper ESD procedures. This means that the parts should be packed in conductive packaging material and, when not in this packaging, should be placed only on a static-free surface. Anyone handling these items should be properly grounded through a wrist strap that has a common ground with the static-free work surface.

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Remove the Top Cover

WARNING	This procedure is intended for use by Agilent-trained service personnel only. There are no user-serviceable parts inside the 35900E Series II.

1 Place the unit on a table so that the back is visible to you (cables visible).

2 Turn off the unit and remove the power cord.

WARNING	When removing or replacing the subassembly inside the 35900E Series II, be certain the power cord is unplugged from the rear of the unit in order to avoid a potentially dangerous electrical shock.

3 Remove any cables attached to the rear panel.

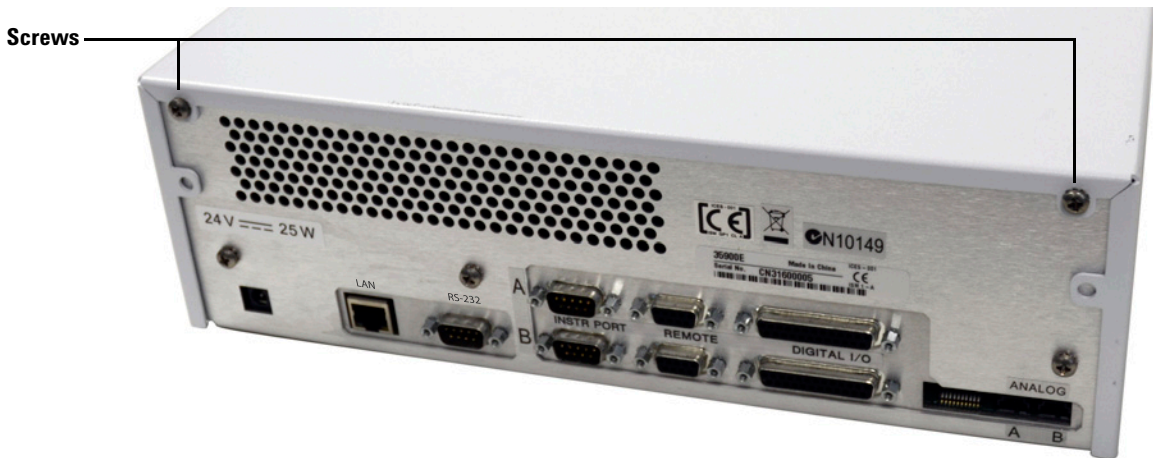**4** Remove the two screws attaching the top cover to the rear panel (see Figure 11).

Figure 11 Removing the top cover

5 Lift up the back of the top cover and slide it off of the unit.

6 When you are ready to replace the top cover, fit the top cover over the frame, slipping the front tabs under the front panel edge.

7 Push the cover firmly down and towards the front until the screw holes are aligned and the back flaps are flush with the back of the unit.

8 Install the two screws on the back of the unit.

Remove the Front Panel

WARNING   **This procedure is intended for use by Agilent-trained service personnel only. There are no user-serviceable parts inside the 35900E Series II.**

CAUTION   The printed circuit (PC) boards in the 35900E Series II can be damaged by electrostatic discharge. Do not touch any of the boards unless it is absolutely necessary. If you must handle them, wear a grounded wrist strap and take other antistatic precautions. Wear a grounded wrist strap any time you must remove the 35900E Series II top cover.

1 Remove the top cover (see Figure 11 on page 44).

2 Remove the ground wire connection (green wire) from the ground clip by pulling it firmly from the chassis (see Figure 12).
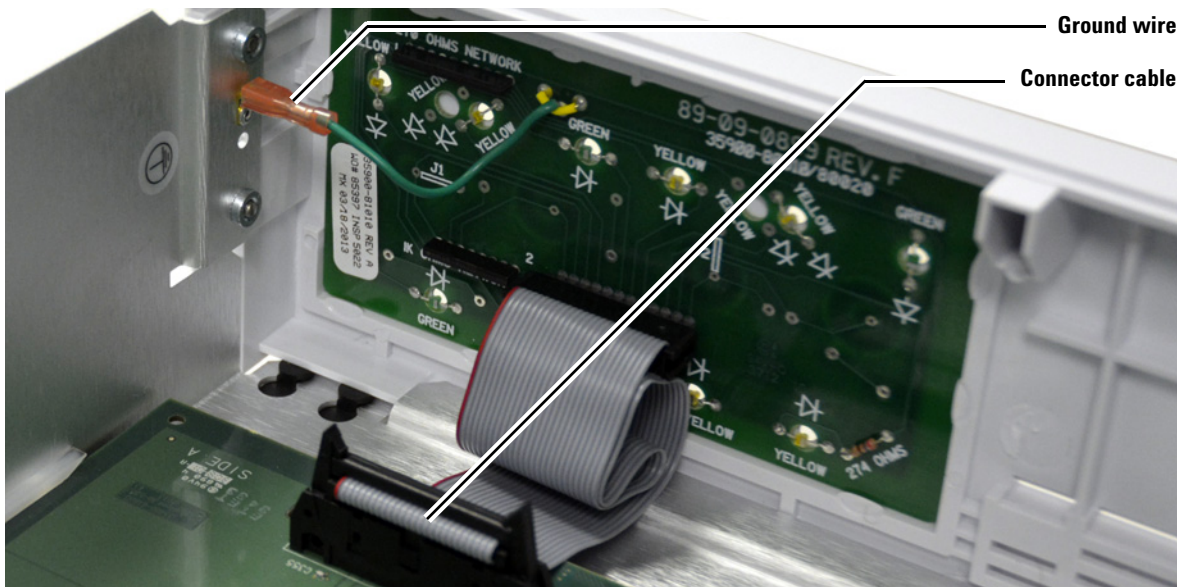

Figure 12   Removing the front panel

3 Disconnect the front panel connector cable from the main board by pushing the clips out on both sides of the connector until the cable pops from the connector (see Figure 12).

4 Remove the four screws holding the front panel to the unit (Figure 13).
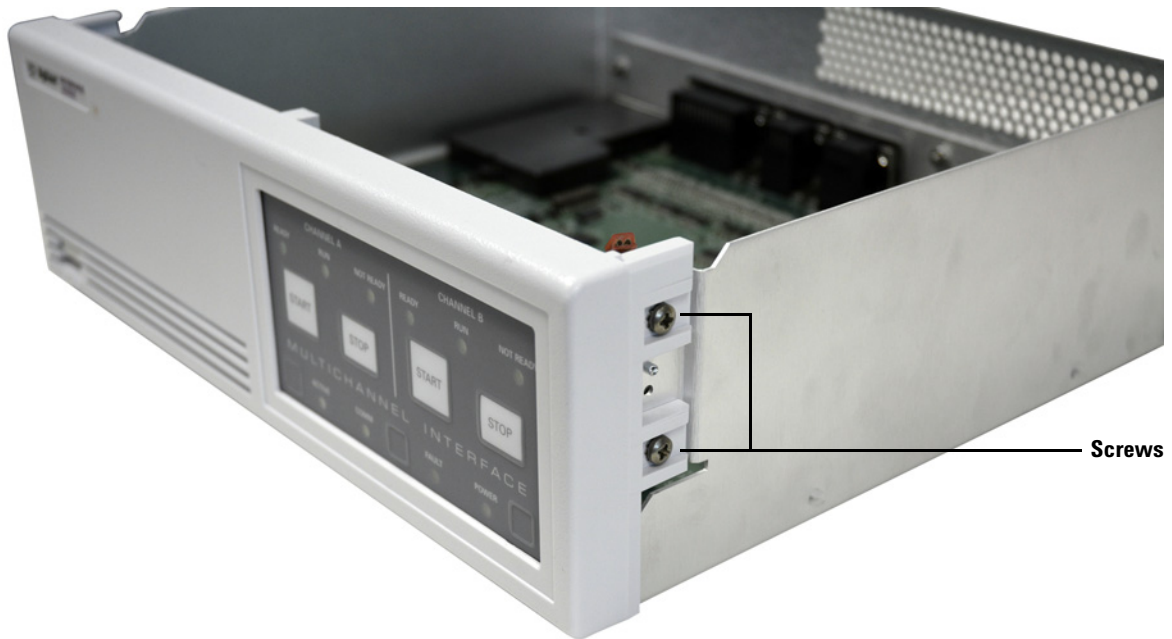

Figure 13   Remove screws to remove the front panel (right side shown)

5 Gently pull the front panel forward until it detaches from the frame.

6 When you are ready to reinstall the front panel, fit the bottom lip of the front panel under the lip of the frame and push it against the frame, fitting the power switch into the hole.

7 Replace the four screws, two on each side (see Figure 13 above).

8 Connect the front panel cable to the connector, pressing firmly until the ears of the connector lock over the ends of the black connector (see Figure 12 on page 45).

9 Reattach the green ground wire to the ground clip on the chassis (see Figure 12 on page 45).

Replace the Main Board

WARNING	This procedure is intended for use by Agilent-trained service personnel only. There are no user-serviceable parts inside the 35900E Series II.

Remove the main board

1 Remove the top cover. (See "Remove the Top Cover" on page 44.)

2 Remove the front panel. (See "Remove the Front Panel" on page 45.)

3 Disconnect the power cable.

4 Remove the three screws attaching the main board on the back of the unit (Figure 14).

Screws

Figure 14   Remove screws attaching the main board to the chassis base

5 Slide the main board out towards the front of the unit (Figure 16).
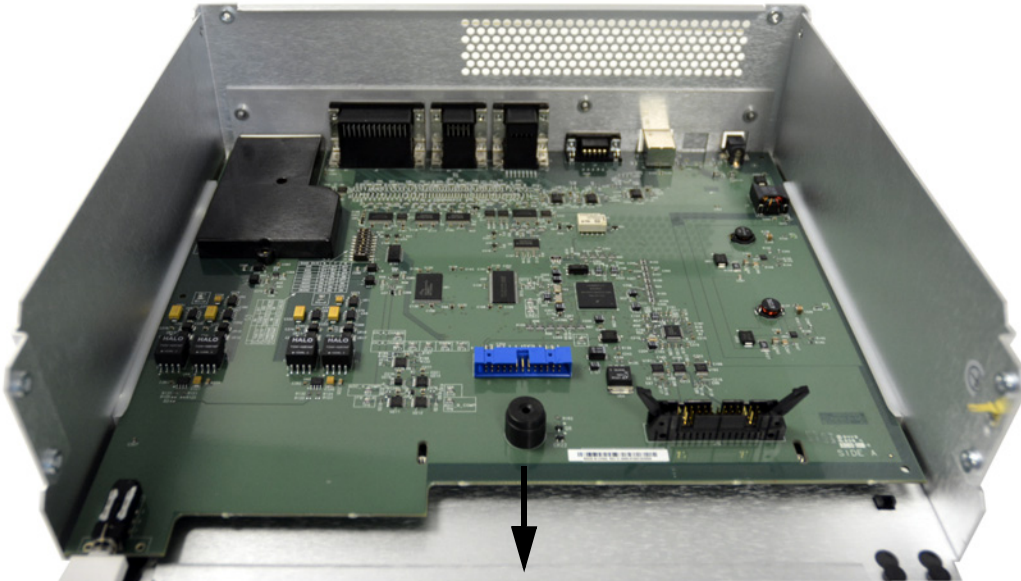

Figure 15   Slide the main board out

Install the main board

1 When you are ready to install the main board, slide the main board into the guides from the front of the unit so that the cable connections fit through the back of the unit.

2 Replace the three screws on the back of the unit and all other removed parts.

7

Instrument Parts

This section provides diagrams for instrument parts of the 35900E Series II.

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Replacement Parts: Covers and Electronics

Table 12   Replacement parts for the 35900E Series II (Figure 16)

Item no.	Description	Part no.	Qty
1	Top cover	35900-01180	1
2	24V DC power converter	0950-4789	1
3	Main board	35900-61000	1
4	Front panel assembly (front cover)	35900-61130	1
5	Guide, PC board	0403-0102	2

1

2

3

5

4
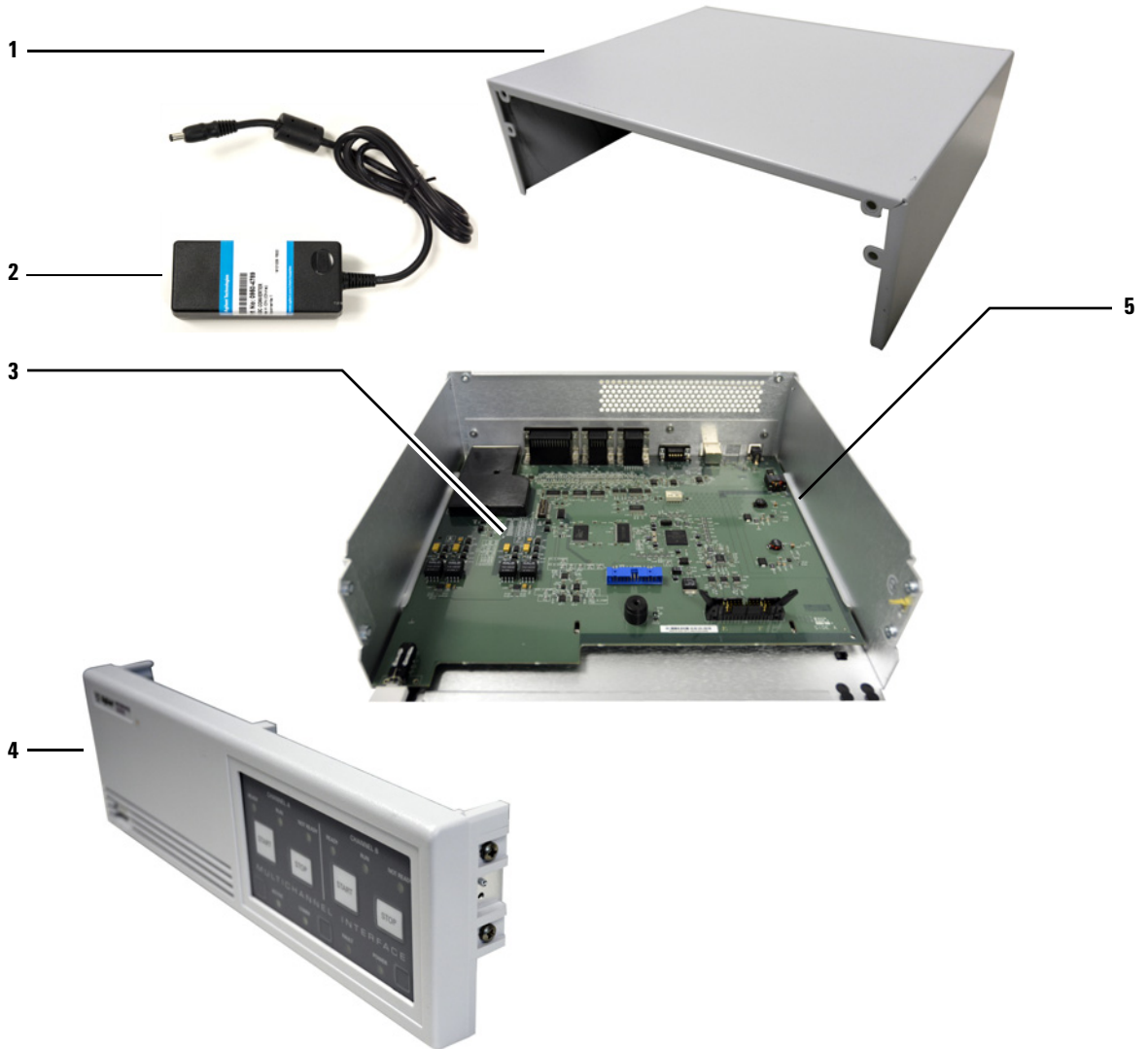
Figure 16 Replacement parts breakdown

Power Cords

Table 13   Power cords for 35900E Series II

Part no.	Description
8120-1369	Power cord, Australia/New Zealand, C13, 10 amp
8120-1378	Power cord, United States, C13, 125 volt, 10 amp, 5-15P, 498G
8120-1689	Power cord, Europe, C13, 10 amp
8120-2104	Power cord, Switzerland, C13, 10 amp
8120-3997	Power cord, Denmark/Greenland, C13, 10 amp
8120-4211	Power cord, India/South Africa, C13, 10 amp
8120-4753	Power cord, Japan, C13, 125 volt
8120-5182	Power cord, Israel, C13, 10 amp
8120-6869	Power cord, Argentina, C13, 250 volt, 10 amp, RA/3
8120-6978	Power cord, Chile, C13, 10 amp
8121-0723	Power cord, China, C13, 10 amp, 250 volt
8120-8705	Power cord, Great Britain/Hong Kong/Singapore/Malaysia, C13, 10 amp
8121-1226	Power cord, Europe/South Korea, C13, 10 amp, 250 volt
8121-1809	Power cord, Brazil, C13, 250 volt max

A
Cables

This section provides cable diagrams for the open analog signal, remote control, and bottle number cables that work with the 35900E Series II.

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Analog Signal Cables

Examples of instrument specific analog signal cables are included in this section.
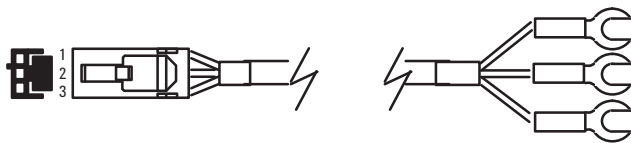
Figure 17   35900-60630, 35900-60900, 35900-60910: General use —spade lugs

Connector 1	Signal name	Connector 2
1	Shield	Orange
2	Signal –	Black
3	Signal +	Red

Figure 18   35900-60570: 5880 GC, 35900-60750: 1050/1046A Fluorescence detector

Connector 1	Signal name	Connector 2
1	Shield	Orange
2	Signal –	Black
3	Signal +	Red
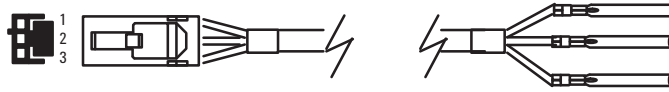
Figure 19   35900-60640: For special purpose square - pins

Connector 1	Signal name	Connector 2
1	Shield	Orange
2	Signal –	Black
3	Signal +	Red

Remote Control

Remote control cable pin assignments are included in this section.
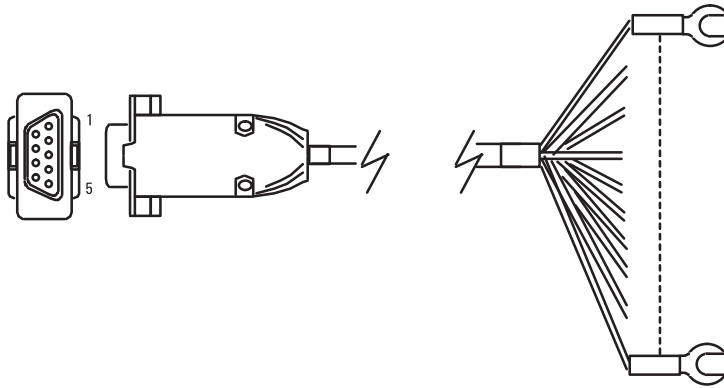
Figure 20   35900-60670, 35900-60920: Remote control cable pin assignments

Connector 1	Connector 2	Remote signal
1	Black	GND
2	White	Prepare
3	Red	Start
4	Green	Shut Down
5	Brown	Reserved
6	Blue	Power On
7	Orange	Ready
8	Yellow	Stop
9	Violet	Start Request
–	Black tubing	Shield

Note: When used for remote control, this cable attaches directly to remote port on back of 35900E Series II. when used for digital I/O or bottle numbers, the Digital I/O Adaptor Cable must be used to connect to the 35900E Series II.

APG Remote Control

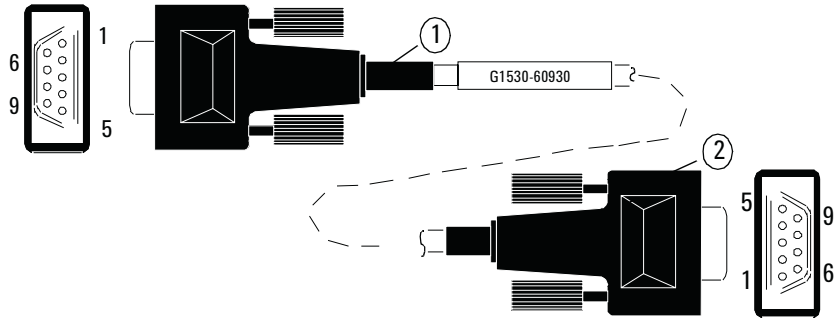APG Remote control cable pin assignments are included in this section.

Figure 21   G1530-60930: APG Remote control cable pin assignments

Connector 1 (male)	Signal name	Connector 2 (male)
1	GND	1
2	Prepare	2
3	Start	3
4	Start relay	4
5	Start relay	5
6	No connection	6
7	Ready	7
8	Stop	8
9	No connection	9

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Bottle Number Cables

Examples of instrument specific bottle number cables are included in this section.
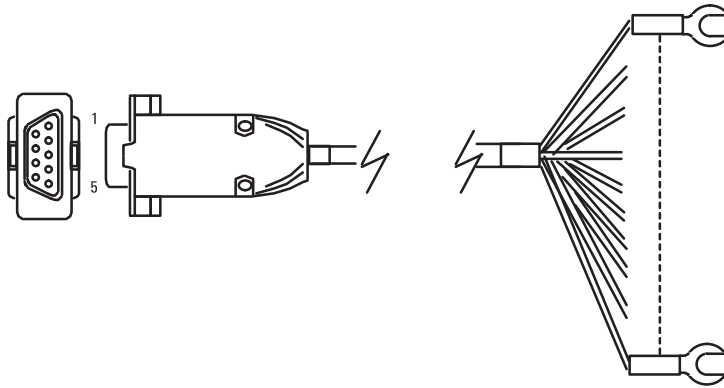
Figure 22   35900-60670, 35900-60920: Bottle number cable diagram

Connector 1	Connector 2	Remote signal
1	Black	Ground
2	White	Binary Code Decimal (BCD) 1
3	Red	BCD 2
4	Green	BCD 4
5	Brown	BCD 8
6	Blue	BCD 80

Note: When used for remote control, this cable attaches directly to remote port on back of 35900E Series II. When used for digital I/O or bottle numbers, the digital I/O adaptor cable must be used to connect to the 35900E Series II.

Connector 1	Connector 2	Remote signal
7	Orange	BCD 20
8	Yellow	BCD 40
9	Violet	BCD 10
-	Black tubing	Shield

Note: When used for remote control, this cable attaches directly to remote port on back of 35900E Series II. When used for digital I/O or bottle numbers, the digital I/O adaptor cable must be used to connect to the 35900E Series II.

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