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HP 5890A / HP 5890 Series II and Autosampler IPM Installation Manual

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Release History

Part Number	Release	Publication Date
N515-6073	A	May 2001

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NOTE: *TotalChrom is the updated version of the software previously marketed as Turbochrom. This product is compatible with TotalChrom and Turbochrom version 6.1.x. The term TotalChrom has been used throughout this document to denote either system.*

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HP 5890A
Autosampler Controller IPM

The 600 Series LINK Interface is used with PerkinElmer software products to acquire and buffer digital data from laboratory instruments and to control the operating parameters of such instruments. To perform these functions, firmware must be downloaded from the host computer to the LINK Interface. This firmware is called an Instrument Personality Module (IPM); there is a unique IPM for each instrument that can be controlled by the LINK Interface.

In addition to downloading the IPM to LINK, the host software requires configuration information that describes the features available on the specific instrument in use. This information is contained in a LIB file that is read by the configuration utility of the host software.

The distribution media for the host software contains the IPM and LIB files required to operate an HP 5890A gas chromatograph or an HP 5890 Series II gas chromatograph that can emulate an HP 5890A. However, in most cases, an HP 5890 Series II gas chromatograph will be operated in "native" mode as described in the next section of this manual, "HP 5890 Series II Autosampler Controller IPM." Either of two autosampler controllers may be used: HP 7673A Controller or HP GC Autosampler Controller G1512A.

Prior to using the LINK Interface for controlling an HP 5890A gas chromatograph, you must install the HP 5890 IPM PAK (or permission upgrade key for Turbochrom Professional) that was provided with this manual. This document provides instructions for the following procedures:

- Installation of the necessary cables to connect the HP 5890A Gas Chromatograph and the HP autosampler to a PerkinElmer LINK Interface.
- Initial configuration of the HP 5890A and HP autosampler communication parameters.

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Information concerning installation of the LINK Interface is available in the *600 Series LINK Interface Operator's Manual*. Information on the routine use of the software is available in the product documentation.

HP Hardware Requirements

Before connecting the LINK Interface to the HP 5890A, an RS-232C Serial Interface must be installed in the HP 5890A. This interface (HP P/N 19242-60030) is part of the RS-232C Serial Interface Option (HP P/N 19254A).

When installing the Serial Interface in an HP 5890 Series II, verify that the chromatograph is configured to emulate an HP 5890A. The instrument is in emulation mode when a jumper is installed at P15 of the Main PC Board. Refer to "File Compatibility with Data Handling Devices" in the HP 5890 Series II Reference Manual for details.

HP 7673A Controller

Before connecting the LINK Interface to an HP 7673A controller, an RS-232C Serial Interface must be installed in the HP 7673A. This interface (HP P/N 18594-60080) is part of the RS-232 Serial Control Option (HP P/N 18599R and 18599S). Order HP 18599S if you do not already have a controller board (HP P/N 18594-60060); order HP 18599R if you have a controller board. Note that installation of this interface disables local control of the autosampler.

While installing the RS232C Interface, be sure to configure the baud rate as described in "HP 7673A HARDWARE CONFIGURATION" later in this manual. Also check the revision of the controller board EPROM. The EPROM is labeled 18594-80NNN, and NNN must be 120 or higher to operate with the Serial Interface. A satisfactory EPROM should be received with the Serial Control Option.

If a PerkinElmer Service or Support Engineer installs the LINK Interface, it is customer's responsibility to have the above-mentioned HP interfaces installed prior to the PerkinElmer installation.

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Cable Requirements

To connect the LINK Interface to the HP 5890A Serial Interface, use PerkinElmer P/N 6560-5810. The cable that is included with the RS-232C Serial Interface Option (HP P/N 19254A) is not used.

To connect the LINK Interface to an HP 7673A Controller Serial Interface, use PerkinElmer P/N 6560-7610 or 6560-7625 (10 or 25 feet).

To connect the LINK Interface to an HP GC Autosampler Controller G1512A, use PerkinElmer P/N S501-0015 or S501-0016 (10 or 25 feet). Alternatively, you can use a cable for an HP 7673A fitted with a standard 9- to 25-pin adapter.

Wiring diagrams of the cables listed above are provided in Appendix B of this manual.

Connect the controller to the next LINK port with respect to the associated HP 5890A (e.g., HP 5890A on port C, controller must be on port D).

To connect the Remote Start Cable:

- For an HP 7673A Controller, install HP P/N 18594-60570 from the HP 5890A “Remote Start” port to the “Remote” port on the controller.
- For an HP GC Autosampler Controller G1512A, install HP P/N G1512-60530 from the HP 5890A “Remote Start” port to the “APG Remote” port on the controller.

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HP 5890A Hardware Configuration

The LINK Interface sends commands to the HP 5890A and the HP autosampler controller to set most of the necessary communication parameters. However, each device requires initial configuration before the LINK Interface can communicate sufficiently to set the other parameters.

If you are using an HP 5890 Series II, it is necessary to configure the chromatograph to emulate an HP 5890A. First determine the current configuration mode:

1. Turn the HP 5890 Series II power OFF, then ON.
2. Examine the GC display. If it displays “EMULATION MODE OK,” then the GC is already in emulation mode and you should skip to the next paragraph. If the display reads “PASSED SELF TEST,” then the configuration must be changed by installing a jumper on P15 of the HP 5890 Main PC Board, as described in “File Compatibility with Data Handling Devices” in the *HP 5890 Series II Reference Manual.*

The initial configuration of an HP 5890A, or an HP 5890 Series II emulating an HP 5890A, is performed using the keypad of the chromatograph:

1. Press the “CLEAR” key and then press the “.” key.

   The HP 5890A will display

   CALIB AND TEST [0-9]
2. Press the “3” key.

   The HP 5890A will display

   CONFIGURE NETWORK
3. Press the “ENTER” key once or twice until the HP 5890A displays

   GLOBAL ADDR: ##,##
4. Press the "ON" key.

   The HP 5890A will display

   GLOBAL ADDR: ##,##

   This sets the HP 5890A in Global mode.
5. Press the “1” key and then the “7” key. This specifies 9600 baud and STRQ bypassed.

   The HP 5890A will display

   DEFAULT ADDRESS * 17

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6. Press “ENTER.”

   The HP 5890A will display

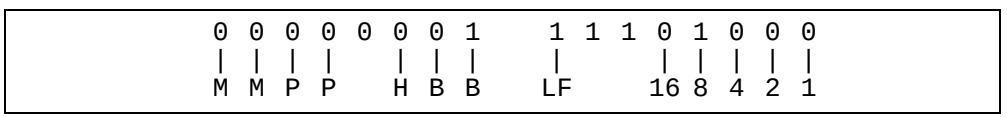
   `GLOBAL ADDR: ##,17`

7. Press “CLEAR,” then “.”, then “5”, then “ENTER.” This initiates a self-test; at the completion of the self-test the new communication parameters become active.

HP Autosampler Controller Hardware Configuration

Before installing the RS-232C Interface in the HP autosampler controller, set the baud rate:

- On an HP 7673A, locate the baud rate configuration header at W1 on the RS232 Serial Interface, and place the shunt on the pair of pins labeled 9600.
- On an HP GC Autosampler Controller G1512A, configure the baud rate by setting the DIP switches on the back of the controller as follows:



Functions Supported

The IPM for the HP 5890A supports the instrument functions and configurations listed in Table 1 (see the next section). The accepted values for configuration options and method parameters are also tabulated.

Operational Notes

1. Setting the Detector Temperature (item 20 in Table 1) to 0 sets both the detector zone heater and the detector electronics to Off.
2. The Detector Range selection (item 16 in Table 1) affects the specified (A or B) detector, not signal source.

For a list of LINK Error Messages, refer to Appendix A.

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Table 1: Supported Instrument Functions

FUNCTION	PARAMETER VALUES
Inlet Type	None, Packed, Capillary, GSV, PTV
Valves Installed (A, B)	None, Purge
Detectors (A, B)	FID, TCD, ECD, NPD, EICD, FPD
Data Channel (A, B)	Det A, Det B, Det A - Det B, Det B - Det A, Det A - Comp1, Det A - Comp2, Det B - Comp1, Det B - Comp2, Comp1, Comp2, Test Plot
Analog Attenuation	0 to 10
Sampling Rate	20, 10, 5, 2.5, 1.25
Injection Type	Manual, Auto
Syringe Capacity	5µL, 10µL
Sample Size	5µL: 0.5, 1.0, 1.5, 2.0, 2.5µL 10µL 1.0, 2.0 3.0, 4.0, 5.0µL
Injection Speed	Normal, On-Column
Pre-Inj Sample Wash	0 to 15
Sample Pumps	0 to 15
Viscosity Delay	0 to 7 sec
Post-Inj Solvent Washes	0 to 15
Valve State (A, B)	On, Off
Detector Range (A, B)	0 to 13
Detector Polarity (TCD)	+, -
Detector Autozero	-830,000 to 830,000
Inlet Temperature	0 to 400, 0 = Off
Detector Temperature	0 to 400
Oven Max. Temperature	70 to 400
Oven Equilibration Time	0 to 200 min

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FUNCTION	***PARAMETER VALUES***
Cryogenics	Off, LN2, CO2
Oven Temp Program	
a. Initial Temp	-80 to 400° C
b. Initial Hold	0 to 650 min
c. Ramps (3)	
(i) Rate	0 to 70.0 degree/min
(ii) End Temp	0 to 400° C
(iii) Hold Time	0 to 650 min
Injection Site	Front, Rear
Vial Number	1 to 100
Injections Per Vial	No constraint

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HP 5890 Series II Autosampler Controller IPM

The PerkinElmer 600 Series LINK Interface is used with PerkinElmer software products to acquire and buffer digital data from laboratory instruments and to control the operating parameters of such instruments. To perform these functions, firmware must be downloaded from the host computer to the LINK Interface. This firmware is called an Instrument Personality Module (IPM); there is a unique IPM for each instrument that can be controlled by the LINK Interface.

In addition to downloading the IPM to LINK, the host software requires configuration information that describes the features available on the specific instrument in use. This information is contained in a LIB file that is read by the configuration utility of the host software.

The distribution media for the host software contains the IPM and LIB files required to operate an HP 5890 Series II or an HP 5890 Series II+ gas chromatograph. Either of two autosampler controllers may be used: HP 7673A Controller or HP GC Autosampler Controller G1512A.

Prior to using the LINK Interface for controlling an HP 5890 Series II gas chromatograph, you must install the HP 5890 IPM PAK (or permission upgrade key for Turbochrom Professional) that was provided with this manual. This document provides instructions for the following procedures:

- Installation of the necessary cables to connect the HP 5890 Series II Gas Chromatograph and the HP autosampler to a PerkinElmer LINK Interface.
- Initial configuration of the HP 5890 Series II and HP autosampler communication parameters.

Information concerning installation of the LINK Interface is available in the *600 Series LINK Interface Operator's Manual*. Information on the routine use of the software is available in the product documentation.

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HP Hardware Requirements

Before connecting the LINK Interface to the HP 5890 Series II, an RS-232C Serial Interface must be installed in the HP 5890 Series II. This interface (HP P/N 19242-60030) is part of the RS-232C Serial Interface Option (HP P/N 19254A).

When installing the Serial Interface in an HP 5890 Series II, verify that the chromatograph is configured as a HP 5890 Series II. The instrument is properly configured when a jumper is removed at P15 of the Main PC Board. Refer to "File Compatibility with Data Handling Devices" in the HP 5890 Series II Reference Manual for details.

HP 7673A Controller

Before connecting the LINK Interface to an HP 7673A controller, an RS-232C Serial Interface must be installed in the HP 7673A. This interface (HP P/N 18594-60080) is part of the RS-232 Serial Control Option (HP P/N 18599R and 18599S). Order HP 18599S if you do not already have a controller board (HP P/N 18594-60060); order HP 18599R if you have a controller board. Note that installation of this interface disables local control of the autosampler.

While installing the RS232C Interface, be sure to configure the baud rate as described in the “HP 7673A Hardware Configuration “section of this manual. Also check the revision of the controller board EPROM. The EPROM is labeled 18594-80NNN, and NNN must be 120 or higher to operate with the Serial Interface. A satisfactory EPROM should be received with the Serial Control Option.

If a PerkinElmer Service or Support Engineer installs the LINK Interface, it is customer's responsibility to have the above-mentioned HP interfaces installed prior to the PerkinElmer installation.

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Cable Requirements

To connect the LINK Interface to the HP 5890 Series II Serial Interface, use PerkinElmer P/N 6560-5810. The cable that is included with the RS-232C Serial Interface Option (HP P/N 19254A) is not used.

To connect the LINK Interface to an HP 7673A Controller Serial Interface, use PerkinElmer P/N 6560-7610 or 6560-7625 (10 or 25 feet).

To connect the LINK Interface to an HP GC Autosampler Controller G1512A, use PerkinElmer P/N S501-0015 or S501-0016 (10 or 25 feet). Alternatively, you can use a cable for an HP 7673A fitted with a standard 9- to 25-pin adapter.

Wiring diagrams of the cables listed above are provided in Appendix B of this manual.

Connect the controller to the next LINK port with respect to the associated HP 5890 Series II (e.g., HP 5890 Series II on port C, controller must be on port D).

To connect the Remote Start Cable:

- For an HP 7673A Controller, install HP P/N 18594-60570 from the HP 5890 Series II “Remote Start” port to the “Remote” port on the controller.
- For an HP GC Autosampler Controller G1512A, install HP P/N G1512-60530 from the HP 5890 Series II “Remote Start” port to the “APG Remote” port on the controller.

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HP 5890 Series II Hardware Configuration

The LINK Interface sends commands to the HP 5890 Series II and the HP autosampler controller to set most of the necessary communication parameters. However, each device requires initial configuration before the LINK Interface can communicate sufficiently to set the other parameters.

First, determine the current configuration mode of the GC:

1. Turn the HP 5890 Series II power OFF, then ON.
2. Examine the GC display. If it displays “PASSED SELF TEST,” then the GC is already in Series II mode and you should skip to the next paragraph. If the display reads “EMULATION MODE,” then the configuration must be changed by removing a jumper on P15 of the HP 5890 Series II Main PC Board, as described in “File Compatibility with Data Handling Devices” in the *HP 5890 Series II Reference Manual*. To avoid losing the jumper, leave it attached to one pin.

The initial configuration of an HP 5890 Series II is performed using the keypad of the chromatograph:

1. Press the “CLEAR” key and then press the “.” key.

   The HP 5890 Series II will display

   `CALIB AND TEST [0-9]`
2. Press the “3” key.

   The HP 5890 Series II will display

   `CONFIGURE NETWORK`
3. Press the “ENTER” key once or twice until the HP 5890A displays

   `GLOBAL ADDR: ##,##`

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4. Press the "ON" key.

   The HP 5890 Series II will display

   `GLOBAL ADDR: ##,##`

   This sets the HP 5890 Series II in Global mode.

5. Press the “1” key and then the “7” key. This specifies 9600 baud and STRQ bypassed.

   The HP 5890 Series II will display

   `DEFAULT ADDRESS * 17`

6. Press “ENTER.”

   The HP 5890 Series II will display

   `GLOBAL ADDR: ##,17`

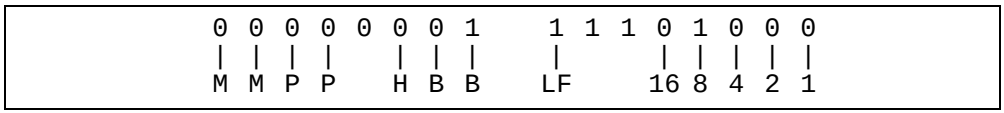
7. Press “CLEAR,” then “.”, then “5”, then “ENTER.” This initiates a self-test; at the completion of the self-test the new communication parameters become active.

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HP Autosampler Controller Hardware Configuration

Before installing the RS-232C Interface in the HP autosampler controller, set the baud rate:

- On an HP 7673A, locate the baud rate configuration header at W1 on the RS232 Serial Interface, and place the shunt on the pair of pins labeled 9600.
- On an HP GC Autosampler Controller G1512A, configure the baud rate by setting the DIP switches on the back of the controller as follows:



Functions Supported

The IPM for the HP 5890 Series II supports the instrument functions and configurations listed in Table 1 (see the next section). The accepted values for configuration options and method parameters are also tabulated.

Operational Notes

Setting the Detector Temperature (item 20 in Table 1) to 0 sets both the detector zone heater and the detector electronics to Off.

The Detector Range selection (item 16 in Table 1) affects the specified (A or B) detector, not signal source.

The display of the GC constantly changes to reflect incoming data.

For a list of LINK Error Messages, refer to Appendix A.

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Table 1: Supported Instrument Functions

FUNCTION	PARAMETER VALUES	NOTES
Inlet Type	None, Packed, Capillary, GSV, PTV, POCI, POCO	PKD = Packed Column CAP = Capillary GSV = Gas Sampling Valve PTV = Programmable Temperature Vaporizing Injector POCx = Programmable On Column
Valves Installed (A, B, 1, 2, 3, 4)	None, Purge, Valve	
Detectors (A, B)	FID, TCD, ECD, NPD, EICD, FPD, PID, AED, IRD, MSD	FID = Flame Ionization Detector TCD = Thermal Conductivity Detector ECD = Electron Capture Detector NPD = Nitrogen-Phosphorus Detector EICD = Electro Conductivity (= Hall Effect) FPD = Flame Photometric PID = Photo Ionization Detector AED = Atomic Emission IRD = Infrared Detector MSD = Mass Selective (= Mass Spec)

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FUNCTION	PARAMETER VALUES	NOTES
Data Channel (A, B)	Det A, Det B, Det A - Det B, Det B - Det A, Det A - Comp1, Det A - Comp2, Det B - Comp1, Det B - Comp2, Comp1, Comp2, Test Plot	
Column Diameter Column Length	50 to 750 µm 1.00 to 200.00 meters	
Vacuum Compensation	ON, OFF	
Analog Attenuation	0 to 10	
Sampling Rate	20, 10, 5, 2.5, 1.25	
Injection Type	Manual, Auto	
Syringe Capacity	5 µL, 10 µL	
Sample Size	5µL: 0.5, 1.0, 1.5, 2.0, 2.5µL 10µL: 1.0, 2.0, 3.0, 4.0, 5.0µL	
Injection Speed	Normal, On-Column	
Pre-Inj Sample Wash	0 to 15	
Sample Pumps	0 to 15	
Viscosity Delay	0 to 7 sec	
Post-Inj Solvent Washes	0 to 15	
Valve State (A, B)	On, Off	
Detector Range (A, B)	0 to 13	
Detector Polarity (TCD)	+, -	
Detector Autozero	-830,000 to 830,000	
Inlet Temperature (A, B)	0 to 450 °C, 0 = Off	
Detector Temperature	0 to 450 °C, 0 = Off	
Oven Max. Temperature	70 to 450 °C	To protect temperature sensitive columns

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FUNCTION	PARAMETER VALUES	NOTES
Oven Equilibration Time	0 to 200 minutes	
Cryogenics	Off, LN2, CO2	
Cryogenics Timeout	10 to 20 minutes	
Pressure Units	kPa, Psig, Bar	
Pneumatics	Press, Cflow, Pflow	
Pressure Program a. Initial Press b. Initial Hold c. Ramps (3) (i) Rate (ii) End Press (iii) Hold Time	Range of pressures depends on pressure units selected	
Injector Temperature Program a. Initial Temp b. Initial Hold c. Ramps (3) (i) Rate (ii) End Temp (iii) Hold Time	 -80 to 450 °C 0 to 650 min 0 to 70.0 degree/min 0 to 450 °C 0 to 650 min	
Aux Zone	0 to 450 °C	
Pressure/Flow Setpoint	0 to 100 psi, 0 to 690 kPa, 0 to 500 mL/Min	

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FUNCTION	***PARAMETER VALUES***	***NOTES***
Oven Temp Program		
a. Initial Temp	-80 to 450 °C	
b. Initial Hold	0 to 650 min	
c. Ramps (3)		
(i) Rate	0 to 70.0 degree/min	
(ii) End Temp	0 to 450 °C	
(iii) Hold Time	0 to 650 min	
Timed Events:		
a. Det. Polarity (A, B)	+, - ; 0 to 650 min	
b. Valve (1,2)	On, Off; 0 to 650 minutes	
Injection Site	Front, Rear	
Vial Number	1 to 100	
Injections per Vial	No constraint	

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Appendix A
LINK Error Messages

The following errors may be reported by the host software. Following each error is a description of potential problems that may result in the error message. Instrument-specific errors are documented in the next section of this appendix.

0 **No error occurred.**
ERROR command was given and no error had occurred.

1 **File already exists.**
A task tried to create a file, but it already exists.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

2 **File does not exist.**
A task tried to access a non-existent file.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

3 **PCB is already open.**
A task tried to open a Pipe Control Block that was already being used.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

4 **File is already open.**
A task tried to open a file that was already open.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

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5 **File is protected (read only)!**
A task tried to write to a file that is read only.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

6 **PCB has no open file. No file was open.**
A task tried to read from or write to a file that had not been opened yet.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

7 **File not open for write.**
A task tried to write to a file that had not been opened yet.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

8 **File not open for read.**
A task tried to write to a file that had not been opened yet.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

9 **Illegal calling parameters.**
Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

10 **Ran out of memory.**
LINK is not supposed to begin a run if there would not be enough space to hold all the data.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

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11 **Ran out of directory entries.**
LINK has a limit of 512 files. This error could result from a lot of very short runs.

Probably result of connecting too many instruments to LINK.

Could be result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

12 **Ran out of Task Control Blocks.**
This is probably the result of a task which creates new tasks but fails to return Task Control Blocks to system when done. May require that the rogue task execute several times before error occurs.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

13 **Memory Pool does not exist for this file.**
This error should never occur.

14 **Unexpected end of file or device timed-out.**
Probably result of communications failure via Serial Port.

Could be result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

15 **Ran out of Pipe Control Blocks.**
This is probably the result of a task which requests Pipe Control Blocks from System but fails to return them when done. May require that the rogue task execute several times before error occurs.

Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

16 **Pipe Control Block not assigned to Task yet.**
Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

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17 **Illegal filename.**
Illegal characters were given in a filename.

Probably result of bug in Host control program.

Could be result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

18 **File is erased.**

19 **This is a DEVICE not a file.**
An operation was attempted on a device that only applies to a file.

20 **File is too large.**
This error results if you try to download an IPM that is larger than 16K bytes.

Probably result of bug in Host control program.

Could be result of a corrupted IPM file at Host computer.

21 **BIN failed verification during write operation.**
When you download an IPM, LINK always verifies that it was written correctly. If verification fails, then this error would result.

Probably result of missing SRAM chip(s).

Could be result of defective SRAM chip(s).

Could be result of bug in Host control program.

22 **Syntax error on command line.**
Although LINK recognized the command, the parameters on command line do not make sense.

Probably result of bug in Host control software.

Could be result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

23 **Cable not connected.**
Probably result of cable not plugged into LINK port.

Could be result of improperly wired RS-232 cable.

24 **STOP command was given.**
The STOP command does not apply to instrument control and thus should never be issued to an IPM.

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Probably result of bug in Host control software.

25 Binary data not allowed here.
Probably result of bug in Host control software.

26 Not allowed in an INVOKE file.
Probably result of bug in IPM.

Could be result of corrupted IPM.

Could be result of bug in LINK OS EPROM.

27 BIN library is not compatible.
Probably result of using an out-of-date LINK EPROM or an out-of-date IPM.

Could be result of corrupted IPM.

28 BIN library is corrupted or not available.
Probably result of corrupted IPM.

29 Command line parameter is out of range.
Probably result of bug in Host software.

Could be result of bug in IPM or LINK EPROM.

30 BIN module not found in any of the libraries.
LINK could not find the IPM given in the INSTALL command.

Probably result of bug in Host software.

31 Device expected here, not file.
An operation was attempted on a file that is only allowed for a device, such as setting Baud rate with the MODE command.

32 Illegal character found in string.
Probably result of bug in IPM or LINK EPROM.

33 BIN is in use.
This error results if the Host computer tries to erase (BINERASE) or download to (BINCOPY) an IPM while it is in use (still INSTALLED).

Probably result of bug in Host software.

34 Circular input buffer overflowed.
Probably result of data arriving at port before the IPM was installed.

Could be result of bug in IPM.

35 Instrument does not respond.
Probably result of instrument being turned off.

Could be result of disconnected RS-232 cable.

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36 **Command is out of sequence.**
This error results when certain commands are given before prerequisite commands are given.

Probably result of bug in Host software.

37 **Interrupt not serviced fast enough.**
Too much data arrived at instrument port for the CPU to handle.

Probably result of bug in LINK EPROM or bug in IPM.

38 **Handle does not exist.**
Probably result of bug in Host software.

40 **GPIB is not bus controller.**
A non-PerkinElmer program has attempted to communicate to the GPIB address of this LINK.

50 **Command not recognized.**
Probably result of bug in Host software.

Could be result of corrupted IPM.

51 **Record is too long for buffer.**
Probably fault of GPIB or RS-232 communications.

52 **Ran out of Handles.**
This is probably the result of a task which asks for handles from the LINK Operating System, but neglects to give them back when done with them.

Probably result of bug in IPM.

53 **Ran out of Chores.**
This is probably the result of a task which asks for chores from the LINK Operating System, but neglects to give them back when done with them.

Probably result of bug in IPM.

54 **Extra Acknowledgment was received.**
Results when LINK receives a packet protocol acknowledgment it was not expecting.

Probably result of bug in Host software.

60 **Communications error.**
Probably result of incorrect Baud rate.

Could be result of noise on RS-232 line.

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61 **Instrument reports an error.**
Probably result of a problem at the instrument. See tabulation of error messages later in this section.

Could be result of an improper configuration.

The instrument which LINK is controlling has reported an error.

The error message is instrument specific.

62 **IPM was already installed.**
An INSTALL command was issued when an IPM had already been installed at that port.

Probably result of bug in Host software.

63 **Parameter cannot be changed in this mode.**
This error typically occurs when the host system attempts to send a non-setpoint parameter while the chromatograph is in the midst of a run.

64 **This is a read only parameter.**
This error typically occurs when the host system attempts to change a parameter that cannot be edited.

65 **LINK has not taken control of the instrument yet.**
Many instrument commands require that the instrument be seized.

This error results if SEIZE command was not issued first.

Probably result of bug in Host software.

Could be result of someone releasing control of instrument with LINK-TALK and then restarting the Host software.

66 **Autosampler not installed.**
Probably result of improper configuration.

67 **Data segment has not been released with OC command.**
Probably result of bug in Host software.

99 **The subroutine that was called is not finished yet.**
Probably result of bug in IPM.

255 **Fatal system error.**
This error will result on recovery from a Fatal System Error.

A Fatal System Error is signified by LEDs at all four channels appearing to bounce up and down. Set DIP switch 8 ON and then OFF again to have LINK recover (reset itself). Afterwards, an error 255 will be obtained. Write down the register values reported with this error so factory engineers can trace the cause of the malfunction.

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HP5890-Specific IPM Errors

61 ERROR: PUNIT=x

A flow transducer has been configured when none is present.

Run the Config program to set the pneumatics to None, and rebuild any methods to remove the faulty information.

61 CAABx (x = 1-8)

An error occurred while sending a new workfile to the GC. STAB5 occurs when a Series II is not in the Emulation Mode or a method has an incorrect parameter in it.

The error codes are:

1 = The wrong command was received

2 = Data was lost due to buffer overflow

3 = Not used

4 = Wrong Time. This conversation is not allowed because another one is already in progress.

5 = Parameter Error

6 = Setpoint Error during download

7 = Not used by this command

8 = Conversation is not open. A wrong command was received.

61 EVEN010010xx EV (xx = 00,01,11)

This error occurs when the user has not configured the HP5890 with the correct configuration conversation at the GC keypad prior to seizing control of the instrument. The user must complete a configure network conversation from the GC keypad.

61 IFENxxxxxxxxxxxxxxx (x = 0 or 1)

This is the instrument fault string returned from the HP5890; a one indicates the instrument fault condition that was detected.

One means a fault and zero means no fault. Interface refers to the internal GC interface. The characters by position are:

1 = Interface RAM Test

2 = Interface CPU RAM Test

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3 = Interface ROM Test

4 = Interface CPU test

5 = Attn 2 Test

6 = Attn 1 Test

7 = DAC 2 Test

8 = DAC 1 Test

9 = Detector B Temperature

10 = Detector A Temperature

11 = Injector B Temperature

12 = Injector A Temperature

13 = Oven Temperature

14 = Oven Limit

15 = Line Sense

16 = ADC Status

61 RFENpebcd0000 (pbcd = 0 or 1)

This error is returned by the HP5890 GC or the autosampler controller and occurs when there is a parity error, input buffer overflow, the command was lost, or the instrument could not be put into its default mode.

Also occurs when the GC Network Address has not been configured properly.

p = 1 Parity Error

b = 1 Input Buffer Overflow (host sending too quickly)

c = 1 A command was lost

d = 1 A defaults command was executed

61 RIENab000xxxxxxxxxxxx
(a = 0-8 b = " ", A, B x = 0 or 1)

This string reports run and readiness information. Certain fields indicate a problem. If an error is returned by the HP5890 GC, a one in any of the designated fields indicates a run disabled, oven scram or fault condition which caused the chromatograph not to be ready.

First character “a”:

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0 = Run Idle

1 = Pre Run

2 = SCC Pre Run 1

3 = SCC Pre Run 2

4 = SCC Run

5 = Run Active

6 = Report 1

7 = Report 2

8 = Run Disabled (from outside GC)

IF “a” is 4 or 5, then the second character “b” is valid as a RAMP indicator and may be “ ” (space), A, or B for the first, second, or third ramp.

The remaining characters are as follows:

3 = Not used

4 = Not used

5 = Not used

6 = OVEN SCRAM

7 = Signal 2, Detector B not ON

8 = Signal 2, Detector A not ON

9 = Signal 1, Detector B not ON

10 = Signal 1, Detector A not ON

11 = Injector B zone not ready

12 = Injector A zone not ready

13 = Detector A zone not ready

14 = Oven not ready

15 = External not ready

16 = Detector B not ready

17 = Host not ready

18 = Fault

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61 RKABx (x = 1-8)

An error occurred during a keyboard conversation.

The error codes are:

1 = The wrong command was received

2 = Data was lost due to buffer overflow

3 = Not used

4 = Wrong Time. This conversation is not allowed because another one is already in progress.

5 = Parameter Error

6 = Setpoint Error during download

7 = Keyboard error was received in RK command

8 = Conversation is not open. A wrong command was received.

61 SDABx (x = 1-8)

This error typically occurs when the IPM attempts to terminate a send data conversation with the GC after a communications problem has been encountered. Most commonly SDAB2 is received.

The error codes are:

1 = The wrong command was received

2 = Data was lost due to buffer overflow

3 = Not used

4 = Wrong Time. This conversation is not allowed because another one is already in progress.

5 = Parameter Error

6 = Setpoint Error during download

7 = Not used by this command

8 = Conversation is not open. A wrong command was received.

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61 XXABx (XX = Any Command; x = 1-8)

The Abort Stage that is generated when any command causes an error.

The error codes are:

1 = The wrong stage was received

2 = Data was lost due to buffer overflow

3 = Not used

4 = Wrong Time. This conversation is not allowed because another one is already in progress.

5 = Parameter Error

6 = Setpoint Error during download

7 = A keyboard error was received in the RK command

8 = Conversation is not open. A wrong stage was received.

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Autosampler Controller-Specific IPM Errors

61 RFENpbcd0000 (pbcd = 0 or 1)

This error is returned by the HP5890 GC or the autosampler controller and occurs when there is a parity error, input buffer overflow, the command was lost, or the instrument could not be put into its default mode.

Also occurs when the GC Network Address has not been configured properly.

p = 1 Parity Error

b = 1 Input Buffer Overflow (host sending too quickly)

c = 1 A command was lost

d = 1 A defaults command was executed

61 RIENaxxxxxxxx (a = 0-7; x = 0 or 1)

This error is returned by the autosampler controller. A one in any of the designated fields indicates the injector or sample tray error that caused the autosampler not to be ready.

First character, a:

0 = Idle

1 = Idle, Start Button Pressed

2 = In Sequence, waiting for Ready

3 = Setting up bottle(s) for injection

4 = Preparing for injection

5 = Post injection washes

6 = Waiting for Continue from Host

7 = Executing RK Command

Other characters:

2 = External not ready (through either remote input)

3 = Front Injector Not Ready (Door Open, Not Mounted, Error, or Busy)

4 = Rear Injector Not Ready

5 = Sample Tray Not Connected or Error

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6 = Front Injector Communications Error

7 = Rear Injector Communications Error

8 = Sample Tray Communications Error

9 = Injector or Sample Tray Memory Error

61 RKAB6<error message>

Message returned when an error occurs during remote keystroke conversations.

The first group of errors are due to syntax errors. The user should never see these unless there is interference with the RS-232 communications and messages are being corrupted. Check that all connections are secure and cables are free of interference.

Possible errors are:

UNKNOWN COMMAND

ILLEGAL PARAMETER

TOO MANY PARAMETERS

PARAMETER MISSING

The second group of errors are due to an internal problem within the autosampler and beyond the control of LINK. They may require service from HP to resolve.

Possible errors are:

FRONT INJECTOR COMMUNICATIONS ERROR

FRONT INJECTOR SYRINGE ERROR

FRONT INJECTOR TURRET ERROR

FRONT INJECTOR PLUNGER ERROR

FRONT INJECTOR INCOMPLETE INJECTION

FRONT INJECTOR MEMORY ERROR

FRONT INJECTOR NOT INSTALLED

FRONT INJECTOR RESET

FRONT INJECTOR DOOR OPEN/ NOT MOUNTED

REAR INJECTOR COMMUNICATIONS ERROR

REAR INJECTOR SYRINGE ERROR

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REAR INJECTOR TURRET ERROR

REAR INJECTOR PLUNGER ERROR

REAR INJECTOR INCOMPLETE INJECTION

REAR INJECTOR MEMORY ERROR

REAR INJECTOR NOT INSTALLED

REAR INJECTOR RESET

REAR INJECTOR DOOR OPEN/ NOT MOUNTED

TRAY COMMUNICATIONS MESSAGES

TRAY ERROR - BOTTLE LOST/LEFT IN GRIPPER

TRAY ANGULAR AXIS ERROR

TRAY RADIAL AXIS ERROR

TRAY GRIPPER AXIS ERROR

TRAY MEMORY ERROR

TRAY RESET

TRAY NOT CONNECTED

BOTTLE NOT FOUND

INVALID BOTTLE NUMBER

NO SAMPLE(S) TO INJECT

STOP BUTTON PRESSED

UNKNOWN ERROR

61 STAB8<error message>

Message returned when an error occurs during injection sequencing. These errors are due to an internal problem within the autosampler and beyond the control of LINK. They may require service from HP to resolve.

Possible errors are:

FRONT INJECTOR COMMUNICATIONS ERROR

FRONT INJECTOR SYRINGE ERROR

FRONT INJECTOR TURRET ERROR

FRONT INJECTOR PLUNGER ERROR

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FRONT INJECTOR INCOMPLETE INJECTION

FRONT INJECTOR MEMORY ERROR

FRONT INJECTOR NOT INSTALLED

FRONT INJECTOR RESET

FRONT INJECTOR DOOR OPEN/ NOT MOUNTED

REAR INJECTOR COMMUNICATIONS ERROR

REAR INJECTOR SYRINGE ERROR

REAR INJECTOR TURRET ERROR

REAR INJECTOR PLUNGER ERROR

REAR INJECTOR INCOMPLETE INJECTION

REAR INJECTOR MEMORY ERROR

REAR INJECTOR NOT INSTALLED

REAR INJECTOR RESET

REAR INJECTOR DOOR OPEN/ NOT MOUNTED

TRAY COMMUNICATIONS MESSAGES

TRAY ERROR - BOTTLE LOST/LEFT IN GRIPPER

TRAY ANGULAR AXIS ERROR

TRAY RADIAL AXIS ERROR

TRAY GRIPPER AXIS ERROR

TRAY MEMORY ERROR

TRAY RESET

TRAY NOT CONNECTED

BOTTLE NOT FOUND

INVALID BOTTLE NUMBER

NO SAMPLE(S) TO INJECT

STOP BUTTON PRESSED

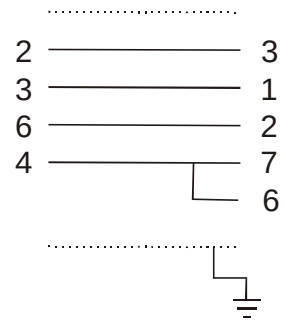
UNKNOWN ERROR

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Appendix B
Wiring Diagrams

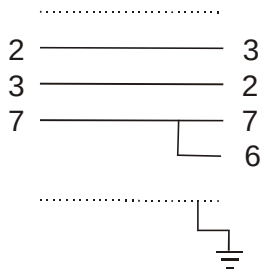
Cable, RS-232, 600 Series to HP 5890
PerkinElmer P/N 6560-5810

HP 5890	600 Series
12-Pin Female	DB9 Male



Cable, RS-232, 600 Series to HP 7673A,
PerkinElmer P/N 6560-7610 and 6560-7625 (10 or 25 feet)

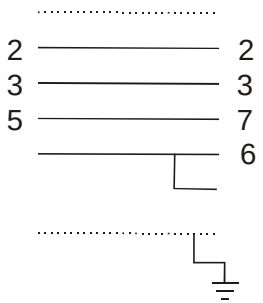
HP 7673 A	600 Series
DB25 Female	DB9 Male



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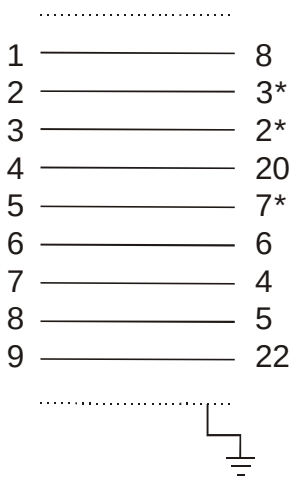
Cable, RS-232, 600 Series to HP G1512A
PerkinElmer P/N S501-0015 and S501-0016 (10 or 25 feet)

HP G1512A	600 Series
Female 9-pin	Male 9-pin



Adapter, Standard 9-Pin to 25-Pin
used with 7673A communication cables and G1512A Controller
PerkinElmer P/N 6560-7610 and 6560-7625 (10 or 25 feet)

Female	Male
9-pin	25-pin



* If you make your own adapter, only these three lines are necessary.

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