9 Maintenance

This chapter provides general information on maintenance of the detector.

Introduction to Maintenance

The module is designed for easy maintenance. Maintenance can be done from the front with module in place in the system stack.

NOTE

There are no serviceable parts inside.

Do not open the module.

Warnings and Cautions

WARNING

Toxic, flammable and hazardous solvents, samples and reagents

The handling of solvents, samples and reagents can hold health and safety risks.

- ➔ When working with these substances observe appropriate safety procedures (for example by wearing goggles, safety gloves and protective clothing) as described in the material handling and safety data sheet supplied by the vendor and follow good laboratory practice.
- ➔ The amount of substances should be reduced to the minimal volume required for the analysis.
- ➔ Do not operate the instrument in an explosive atmosphere.

WARNING

Electrical shock

Repair work at the module can lead to personal injuries, e.g. shock hazard, when the cover is opened.

- ➔ Do not remove the metal top cover of the module. No serviceable parts inside.
- ➔ Only certified persons are authorized to carry out repairs inside the module.

WARNING

Personal injury or damage to the product

Agilent is not responsible for any damages caused, in whole or in part, by improper use of the products, unauthorized alterations, adjustments or modifications to the products, failure to comply with procedures in Agilent product user guides, or use of the products in violation of applicable laws, rules or regulations.

- ➔ Use your Agilent products only in the manner described in the Agilent product user guides.

CAUTION

Safety standards for external equipment

➔ If you connect external equipment to the instrument, make sure that you only use accessory units tested and approved according to the safety standards appropriate for the type of external equipment.

Detector Maintenance Procedures

On the following pages maintenenance procedures are described that can be carried out without opening the main cover.

Table 18 Maintenance Procedures

Procedure	Typical Frequency	Notes
Flow cell flushing	If flow cell is contaminated.	
Leak sensor drying	If leak has occurred.	Check for leaks.
Leak handling System replacement	If broken or corroded.	Check for leaks.
Replacing the detector's Firmware	If not up to date or corrupted.	

Cleaning the Module

The module case should be kept clean. Cleaning should be done with a soft cloth slightly dampened with water or a solution of water and mild detergent. Do not use an excessively damp cloth as liquid may drip into the module.

WARNING

Liquid dripping into the electronic compartment of your module.

Liquid in the module electronics can cause shock hazard and damage the module.

➔ Do not use an excessively damp cloth during cleaning.

➔ Drain all solvent lines before opening any fittings.

Flow Cell Flushing

When If flow cell is contaminated

Tools required Glass syringe, adapter

Parts required

#	Description
1	Strong solvent, tubings to waste

WARNING

Dangerous solvents

The strong solvents used in this procedure are toxic and flammable and proper precautions are necessary.

➔ Wear protective gloves and goggles.

➔ Don't expose yourself to the vapors.

NOTE

Aqueous solvents in the flow cell can build up algae. Therefore do not leave aqueous solvents in the flow cell for long periods. Add a small percentage of organic solvents (e.g. Acetonitrile or Methanol ~ 5%).

NOTE

The strong solvent should dissolve any potential contaminants in the flow cell. For example water for aqueous mobile phase buffers, chloroform or tetrahydrofuran for not water soluble contaminants.

In case the cell is contaminated, follow the procedure below.

1. Flush with the strong solvent.
2. Leave this solution in the cell for about one hour.
3. Flush with mobile phase.

NOTE

Do not exceed the flow cell pressure limit of 5 bar (0.5 MPa).

Correcting Leaks

When If a leakage has occurred in the valve area or at the capillary connections

Tools required Tissue
Two 1/4 inch wrenches for capillary connections

1. Remove the front cover.
2. Open the service door.
3. Use tissue to dry the leak sensor area and the leak pan.
4. Observe the interface ports and the valve area for leaks and correct, if required.
5. Close the service door.
6. Replace the front cover.

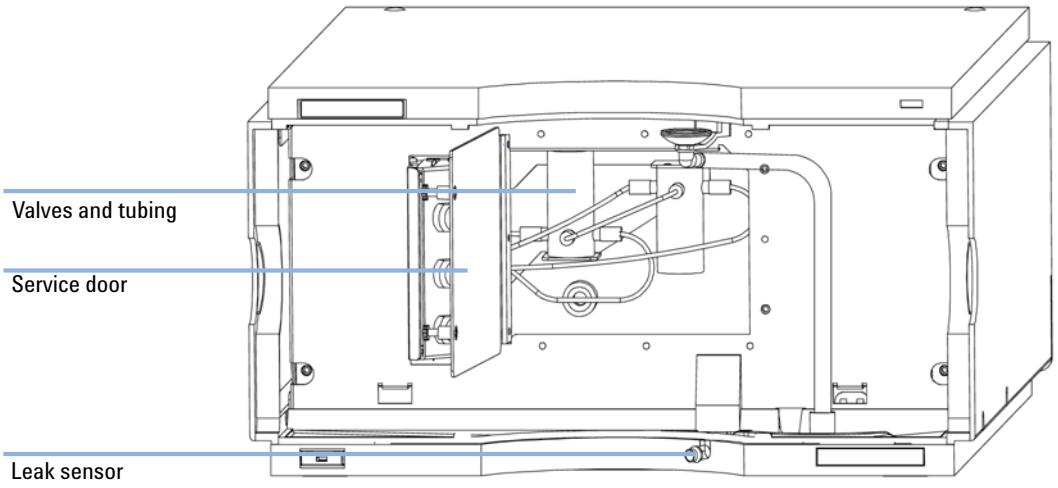


Figure 36 Observing for Leaks

Replacing Leak Handling System Parts

When If the parts are corroded or broken

Parts required

#	p/n	Description
1	5061-8388	Leak funnel
1	5041-8389	Leak funnel holder
1	5042-9974	Tubing Flex (1.5 m)

Leak tubing 120 mm required.

1. Remove the front cover.
2. Pull the leak funnel out of the leak funnel holder.
3. Pull out the leak funnel with the tubing.
4. Insert the leak funnel with the tubing in its position.
5. Insert the leak funnel into the leak funnel holder.
6. Replace the front cover.

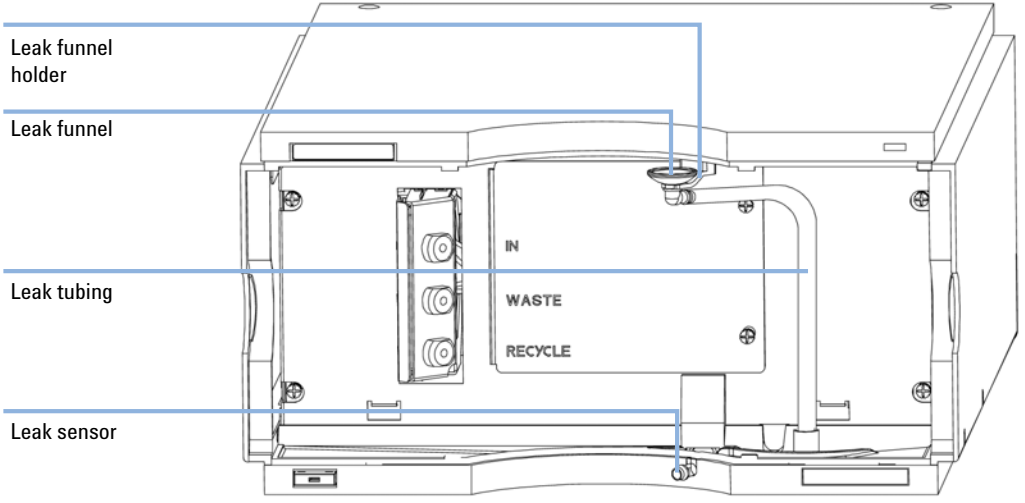


Figure 37 Replacing Leak Handling System Parts

Replacing the Detector's Firmware

When

The installation of newer firmware might be necessary
- if a newer version solves problems of older versions or
- to keep all systems on the same (validated) revision.

The installation of older firmware might be necessary
- to keep all systems on the same (validated) revision or
- if a new module with newer firmware is added to a system or
- if third part control software requires a special version.

Tools required

- LAN/RS-232 Firmware Update Tool or
- Agilent Diagnostic Software
- Instant Pilot G4208A (only if supported by module)

Parts required

#	Description
1	Firmware, tools and documentation from Agilent web site

Preparations

Read update documentation provided with the Firmware Update Tool.

To upgrade/downgrade the module's firmware carry out the following steps:

1 Download the required module firmware, the latest LAN/RS-232 FW Update Tool and the documentation from the Agilent web.
   - http://www.chem.agilent.com/scripts/cag_firmware.asp.

2 To load the firmware into the module follow the instructions in the documentation.

Module Specific Information

There is no specific information for this module.

Replacing the Interface Board

When For all repairs inside the detector or for installation of the board

Parts required

#	p/n	Description
1	G1351-68701	Interface board (BCD) with external contacts and BCD outputs
1	G1369B or G1369-60002	Interface board (LAN)

"Setting the 8-bit Configuration Switch (without On-Board LAN)" on page 33

1 To replace the interface board unscrew the two screws, remove the board, slide in the new interface board and fix it with the board's screws.

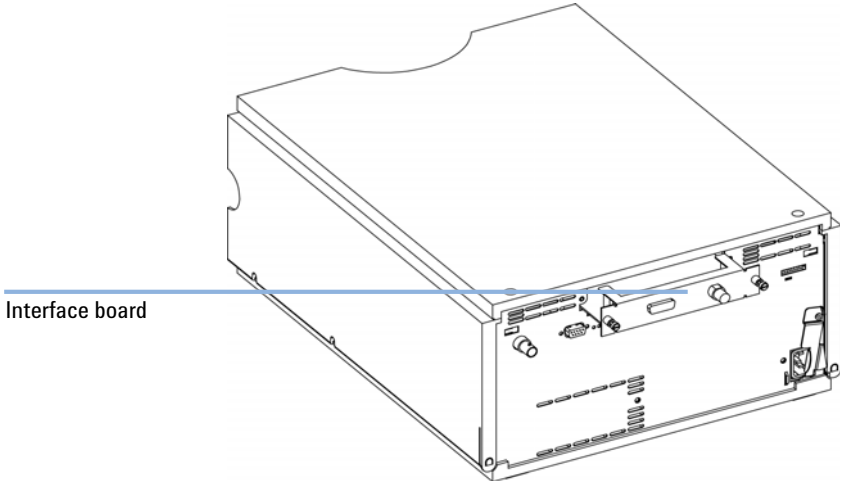


Figure 38 Location of the Interface Board

10
Parts for Maintenance

This chapter provides information on parts for maintenance.

Accessory Kits

Accessory kit (p/n G1362-68755) contains some accessories needed for the installation of the detector.

p/n	Description
G1362-68706	Interface tubing kit
G1362-87300	Interfacing capillary
G1362-87301	Restriction capillary
5181-1516	CAN cable, Agilent module to module, 0.5 m
0100-1847	PEEK adapter 1/4-28 to 10-32 (Adapter AIV to solvent inlet tubes)

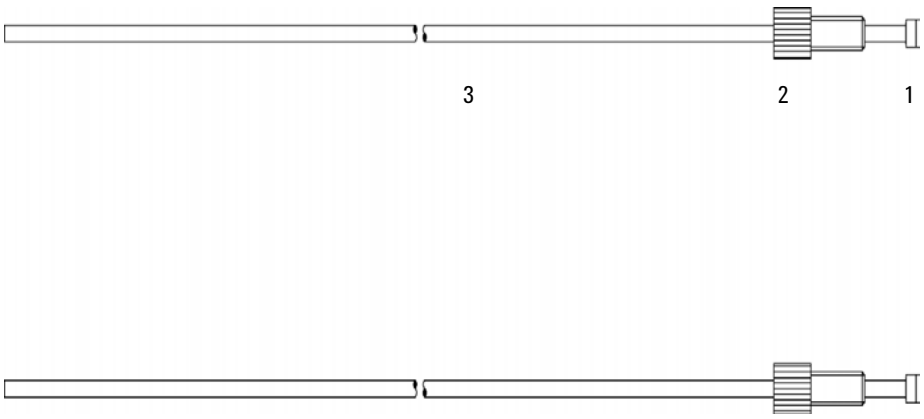


Figure 39 Interface Tubing Kit Parts

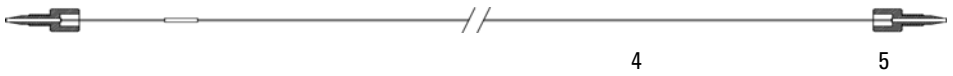


Figure 40 Interfacing Capillary Parts

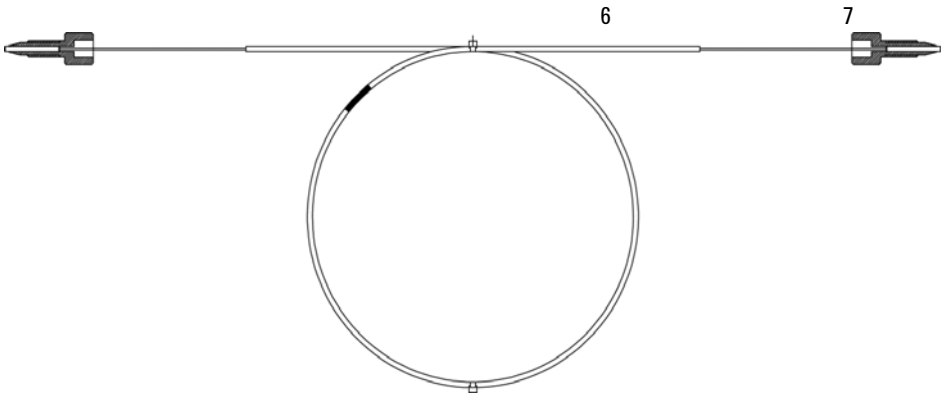


Figure 41 Restriction Capillary Parts

11
Identifying Cables

This chapter provides information on cables used with the Agilent 1260 Infinity LC modules.

Cable Overview

NOTE Never use cables other than the ones supplied by Agilent Technologies to ensure proper functionality and compliance with safety or EMC regulations.

Analog cables

p/n	Description
35900-60750	Agilent module to 3394/6 integrators
35900-60750	Agilent 35900A A/D converter
01046-60105	Analog cable (BNC to general purpose, spade lugs)

Remote cables

p/n	Description
03394-60600	Agilent module to 3396A Series I integrators
	3396 Series II / 3395A integrator, see details in section "Remote Cables" on page 150
03396-61010	Agilent module to 3396 Series III / 3395B integrators
5061-3378	Agilent module to Agilent 35900 A/D converters (or HP 1050/1046A/1049A)
01046-60201	Agilent module to general purpose

BCD cables

p/n	Description
03396-60560	Agilent module to 3396 integrators
G1351-81600	Agilent module to general purpose

CAN cables

p/n	Description
5181-1516	CAN cable, Agilent module to module, 0.5 m
5181-1519	CAN cable, Agilent module to module, 1 m

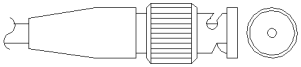
LAN cables

p/n	Description
5023-0203	Cross-over network cable, shielded, 3 m (for point to point connection)
5023-0202	Twisted pair network cable, shielded, 7 m (for point to point connection)

RS-232 cables

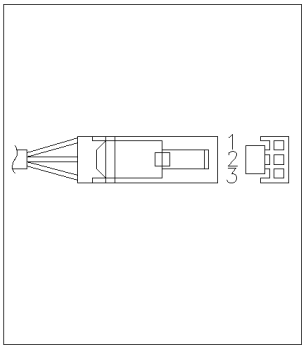
p/n	Description
G1530-60600	RS-232 cable, 2 m
RS232-61600	RS-232 cable, 2.5 m Instrument to PC, 9-to-9 pin (female). This cable has special pin-out, and is not compatible with connecting printers and plotters. It's also called "Null Modem Cable" with full handshaking where the wiring is made between pins 1-1, 2-3, 3-2, 4-6, 5-5, 6-4, 7-8, 8-7, 9-9.
5181-1561	RS-232 cable, 8 m

Analog Cables

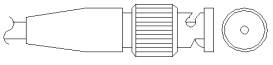


One end of these cables provides a BNC connector to be connected to Agilent modules. The other end depends on the instrument to which connection is being made.

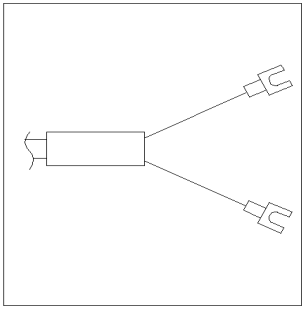
Agilent Module to 3394/6 Integrators

p/n 35900-60750	Pin 3394/6	Pin Agilent module	Signal Name
	1		Not connected
	2	Shield	Analog -
	3	Center	Analog +

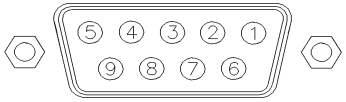
Agilent Module to BNC Connector

p/n 8120-1840	Pin BNC	Pin Agilent module	Signal Name
	Shield	Shield	Analog -
	Center	Center	Analog +

Agilent Module to General Purpose

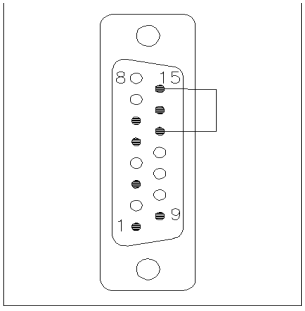
p/n 01046-60105	Pin 3394/6	Pin Agilent module	Signal Name
	1		Not connected
	2	Black	Analog -
	3	Red	Analog +

Remote Cables



One end of these cables provides a Agilent Technologies APG (Analytical Products Group) remote connector to be connected to Agilent modules. The other end depends on the instrument to be connected to.

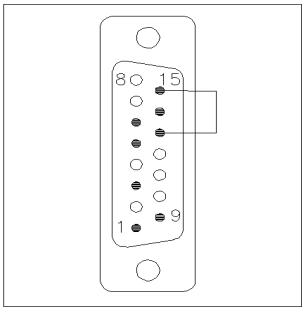
Agilent Module to 3396A Integrators

p/n 03394-60600	Pin 3394	Pin Agilent module	Signal Name	Active (TTL)
	9	1 - White	Digital ground	
	NC	2 - Brown	Prepare run	Low
	3	3 - Gray	Start	Low
	NC	4 - Blue	Shut down	Low
	NC	5 - Pink	Not connected	
	NC	6 - Yellow	Power on	High
	5,14	7 - Red	Ready	High
	1	8 - Green	Stop	Low
	NC	9 - Black	Start request	Low
	13, 15		Not connected	

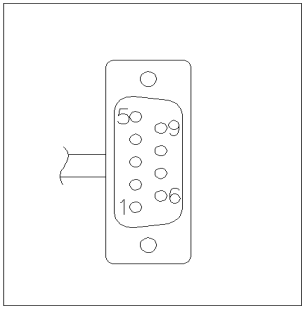
Agilent Module to 3396 Series II / 3395A Integrators

Use the cable Agilent module to 3396A Series I integrators (p/n 03394-60600) and cut pin #5 on the integrator side. Otherwise the integrator prints START; not ready.

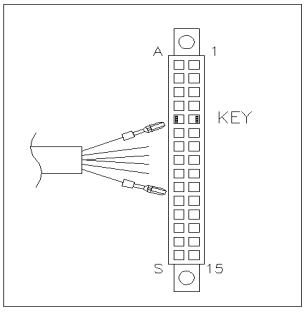
Agilent Module to 3396 Series III / 3395B Integrators

p/n 03396-61010	Pin 33XX	Pin Agilent module	Signal Name	Active (TTL)
	9	1 - White	Digital ground	
	NC	2 - Brown	Prepare run	Low
	3	3 - Gray	Start	Low
	NC	4 - Blue	Shut down	Low
	NC	5 - Pink	Not connected	
	NC	6 - Yellow	Power on	High
	14	7 - Red	Ready	High
	4	8 - Green	Stop	Low
	NC	9 - Black	Start request	Low
	13, 15		Not connected	

Agilent Module to Agilent 35900 A/D Converters

p/n 5061-3378	Pin 35900 A/D	Pin Agilent module	Signal Name	Active (TTL)
	1 - White	1 - White	Digital ground	
	2 - Brown	2 - Brown	Prepare run	Low
	3 - Gray	3 - Gray	Start	Low
	4 - Blue	4 - Blue	Shut down	Low
	5 - Pink	5 - Pink	Not connected	
	6 - Yellow	6 - Yellow	Power on	High
	7 - Red	7 - Red	Ready	High
	8 - Green	8 - Green	Stop	Low
	9 - Black	9 - Black	Start request	Low

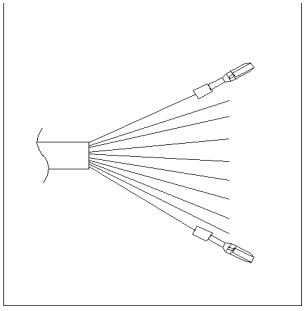
Agilent Module to General Purpose

p/n 01046-60201	Pin Universal	Pin Agilent module	Signal Name	Active (TTL)
		1 - White	Digital ground	
		2 - Brown	Prepare run	Low
		3 - Gray	Start	Low
		4 - Blue	Shut down	Low
		5 - Pink	Not connected	
		6 - Yellow	Power on	High
		7 - Red	Ready	High
		8 - Green	Stop	Low
		9 - Black	Start request	Low

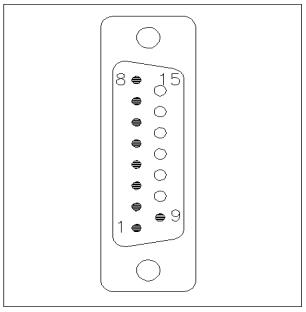
BCD Cables

One end of these cables provides a 15-pin BCD connector to be connected to the Agilent modules. The other end depends on the instrument to be connected to

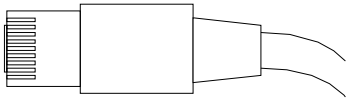
Agilent Module to General Purpose

p/n G1351-81600	Wire Color	Pin Agilent module	Signal Name	BCD Digit
	Green	1	BCD 5	20
	Violet	2	BCD 7	80
	Blue	3	BCD 6	40
	Yellow	4	BCD 4	10
	Black	5	BCD 0	1
	Orange	6	BCD 3	8
	Red	7	BCD 2	4
	Brown	8	BCD 1	2
	Gray	9	Digital ground	Gray
	Gray/pink	10	BCD 11	800
	Red/blue	11	BCD 10	400
	White/green	12	BCD 9	200
	Brown/green	13	BCD 8	100
	not connected	14		
	not connected	15	+ 5 V	Low

Agilent Module to 3396 Integrators

p/n 03396-60560	Pin 3396	Pin Agilent module	Signal Name	BCD Digit
	1	1	BCD 5	20
	2	2	BCD 7	80
	3	3	BCD 6	40
	4	4	BCD 4	10
	5	5	BCD0	1
	6	6	BCD 3	8
	7	7	BCD 2	4
	8	8	BCD 1	2
	9	9	Digital ground	
	NC	15	+ 5 V	Low

CAN/LAN Cables



Both ends of this cable provide a modular plug to be connected to Agilent modules CAN or LAN connectors.

CAN Cables

p/n	Description
5181-1516	CAN cable, Agilent module to module, 0.5 m
5181-1519	CAN cable, Agilent module to module, 1 m

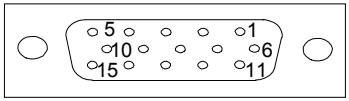
LAN Cables

p/n	Description
5023-0203	Cross-over network cable, shielded, 3 m (for point to point connection)
5023-0202	Twisted pair network cable, shielded, 7 m (for point to point connection)

Agilent Module to PC

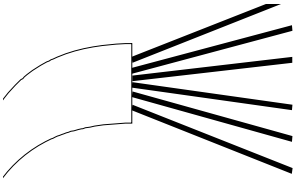
p/n	Description
G1530-60600	RS-232 cable, 2 m
RS232-61600	RS-232 cable, 2.5 m Instrument to PC, 9-to-9 pin (female). This cable has special pin-out, and is not compatible with connecting printers and plotters. It's also called "Null Modem Cable" with full handshaking where the wiring is made between pins 1-1, 2-3, 3-2, 4-6, 5-5, 6-4, 7-8, 8-7, 9-9.
5181-1561	RS-232 cable, 8 m

External Contact Cable



One end of this cable provides a 15-pin plug to be connected to Agilent modules interface board. The other end is for general purpose.

Agilent Module Interface Board to general purposes

External contact cable - Agilent module interface board to general purposes (p/n G1103-61611)	Color	Pin Agilent module	Signal Name
	White	1	EXT 1
	Brown	2	EXT 1
	Green	3	EXT 2
	Yellow	4	EXT 2
	Grey	5	EXT 3
	Pink	6	EXT 3
	Blue	7	EXT 4
	Red	8	EXT 4
	Black	9	Not connected
	Violet	10	Not connected
	Grey/pink	11	Not connected
	Red/blue	12	Not connected
	White/green	13	Not connected
	Brown/green	14	Not connected
	White/yellow	15	Not connected