Technical Manual

Honeywell

LeakFilm 5
5 Channel Conductive Liquid Leak Detection Controller

1. Safety

Ensure that this Operating Manual is read and understood **BEFORE** installing / operating / maintaining the equipment. Pay particular attention to **Warnings** and **Cautions**. All document Warnings are listed here and repeated where appropriate at the start of the relevant chapter(s) of this Operating Manual. **Cautions** appear in the sections/sub-sections of the document where they apply.

WARNINGS

LeakFilm controllers and sensors are designed for installation and use in ordinary areas only. Do not install the controllers and the sensors in hazardous areas.

Installation must be in accordance with the recognised standards of the appropriate authority in the country concerned.

Access to the terminal block for wiring and switches for configuration of the controller, when carrying out any work, must only be conducted by trained personnel.

Before carrying out any work ensure local regulations and site procedures are followed. Appropriate standards must be followed to maintain the overall certifications.

Never attempt to open a plastic enclosure or connector or replace/refit the wire of the sensor while power is still applied to the controller.

LeakFilm controllers must be earthed/grounded for electrical safety and to limit the effects of radio frequency interference. Earth/ground points are provided "F.G." or "SHIELD" terminal of the controllers.

Ensure that all screens/instrument earth/clean earth wiring is earthed/grounded at a single point (either at the controller or master controller - BUT NOT BOTH) to prevent false readings or alarms that may occur due to potential earth/ground loops.

The plastic enclosure of the controllers is a potential electrostatic charging hazard. Avoid any conditions that could result in the controllers becoming electrostatically charged.

Take care when handling LeakFilm sensors as they may be damaged by sharp tools.

LeakFilm controllers should be handled with care to avoid mechanical shock and impact.

Do not expose to temperatures, humidity and other conditions beyond the storage and operating ranges.

LeakFilm controllers must have a suitably rated fuse.

LeakFilm controllers and sensors should be installed in a location free from dust, direct sunlight, temperature extreme, strong magnetic field and heavy vibration.

2. Information

This manual is for use with LeakFilm Sensors and Controllers range only.

The Start-up/Surge/In rush current is dependent on the type of power supply used. The typical start-up current for LeakFilm 5 is less than 300mA at 24VDC. Measure the start-up current using the specific power supply before installation to ensure suitability for your application.

Honeywell Analytics can take no responsibility for installation and/or use of its equipment if not done so in accordance with the appropriate issue and/or amendment of the Technical Manual.

The reader of this Operating Manual should ensure that it is appropriate in all details for the exact equipment to be installed and/or operated. If in doubt, contact Honeywell Analytics for advice.

The following types of notices are used throughout this Operating Manual:

WARNING

Identifies a hazardous or unsafe practice which could result in severe injury or death to personnel.

Caution: Identifies a hazardous or unsafe practice which could result in minor injury to personnel, or product or property damage.

Note: Identifies useful/additional information.

Every effort has been made to ensure the accuracy of this document, however, Honeywell Analytics can assume no responsibility for any errors or omissions in this document or their consequences.

Honeywell Analytics would greatly appreciate being informed of any errors or omissions that may be found in the content of this document.

For information not covered in this document, or if there is a requirement to send comments/ corrections about this document, please contact Honeywell Analytics using the contact details given on the back page.

Honeywell Analytics reserve the right to change or revise the information supplied in this document without notice and without obligation to notify any person or organisation of such revision or change. If information is required that does not appear in this document, contact the local distributor/agent or Honeywell Analytics.

3. Table of Contents

4. Introduction

LeakFilm 5 is a controller connected to the LeakFilm Conductive sensor to detect conductive liquid leaks. It has 5 sensor input channels to connect 5 LeakFilm Conductive sensors and it has an advanced communication function (RS-485). The controller features a buzzer, 3 LEDs indicating the status of power and communication, and 2 LEDs for leak and fault for each channel. The controller also provides a normally open relay for each channel for controlling external equipment such as alarms, sirens, valves or switches.

Due to the fast response time of the LeakFilm sensors, the controller can detect a leak within a few seconds and up to 50m of sensor can be connected to LeakFilm 5. The controller can detect a broken sensor as well as a leak and the fault LED is activated when the broken sensor is detected.

LeakFilm 5 has been designed to be mounted through 2 mounting holes, so that the user can easily install the controller on a wall or in the interior of an electrical control panel.

LeakFilm 5 provides advanced communication functions (RS-485), so that it can be connected to the LeakFilm MC (Master Controller) which can monitor the status of up to 15 controllers.
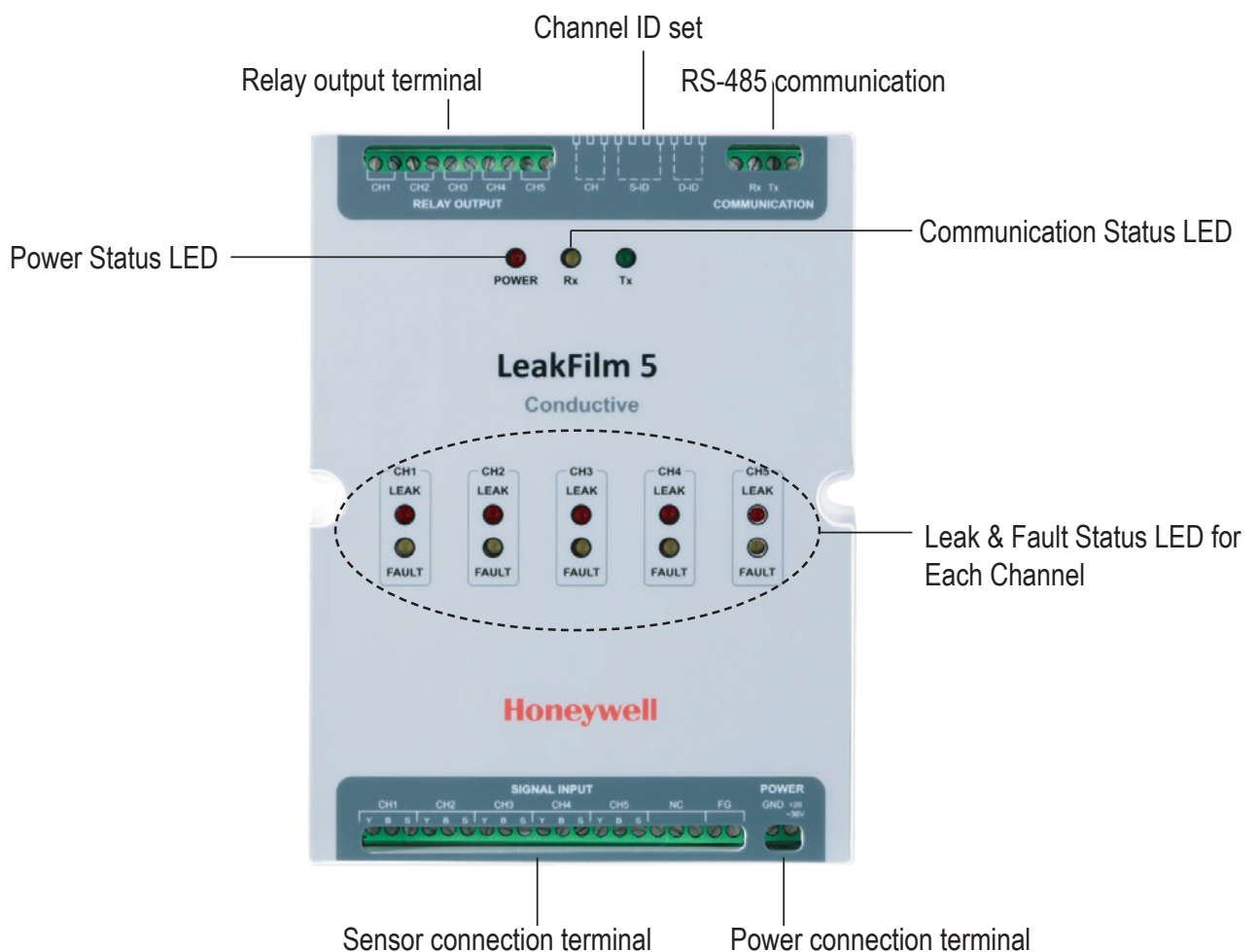

Diagram 1: LeakFilm 5 Overview

4. Introduction

> *Caution:* **LeakFilm 5 can only be used with the LeakFilm Conductive sensor to detect only water or conductive liquid. For a chemical or hydrocarbon leak, use LeakFilm Pro or LeakFilm HC.**

> *Caution:* **LeakFilm 5 cannot detect leak location. For leak location, use LeakFilm Pro.**

4.1 Package Contents

LeakFilm 5 is supplied with pre-configured and 100% tested controller, manual CD-ROM and package box as shown below.

The CD-ROM should run automatically when put into a computer CD-ROM player. If the CD-ROM does not start, click on 'My Computer', locate the CD-ROM and double click the file 'start.exe'.

LeakFilm 5   Manual CD

Diagram 2: Package Box Contents

> ### *WARNINGS*
>
> **When unpacking the product, handle with care to avoid any damage to the product.**
>
> **Do not throw away the box which may be required for product storage or transport, and keep it together with the manual.**

4. Introduction

4.2 LeakFilm Sensors

LeakFilm 5 can only be used with the LeakFilm Conductive sensor, so that it can detect only water or conductive liquid. There are 3 different types of ordering part numbers for LeakFilm Conductive depending on the length.
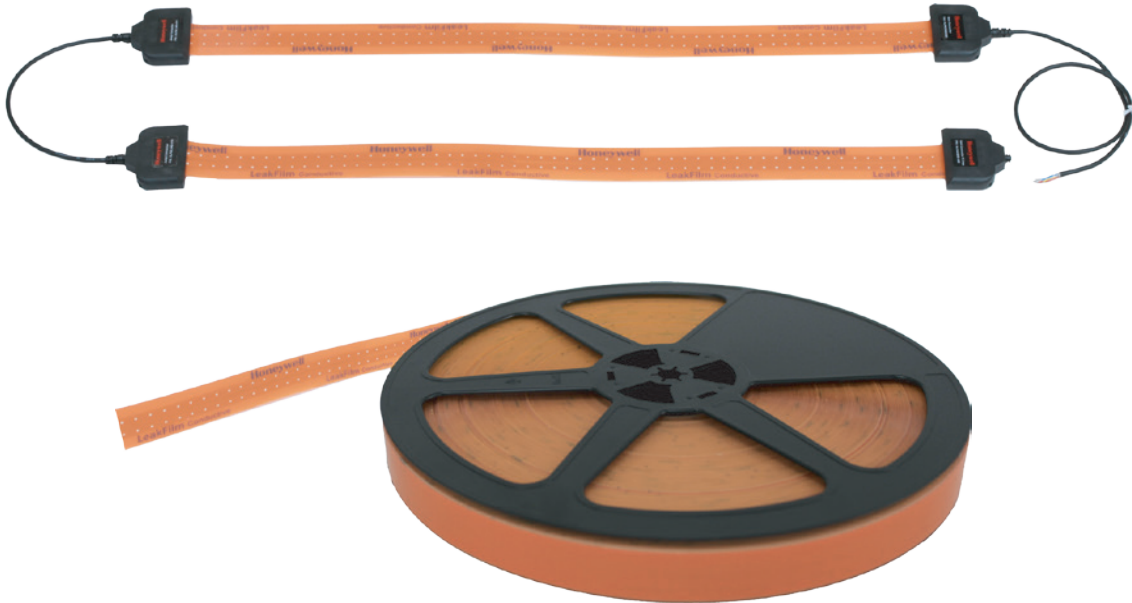
Diagram 3: LeakFilm Conductive

Part number	Product Name	Description
HLFSSCNN-100		100 meter Conductive Sensor
HLFSSCNN-050	LeakFilm Conductive	50 meter Conductive Sensor
HLFSSCNN-001		Custom Length Conductive Sensor

Table 1: LeakFilm Conductive Sensors

4. Introduction

4.3 LeakFilm Connectors

LeakFilm provides 4 different types of connectors which are suitable for various installation environments. LeakFilm connectors were designed to be assembled by snapping, so that only a screw driver is required for assembly. Refer to the LeakFilm Sensor Technical Manual (3013M5006) for instructions on how to assemble the sensor into the connector.
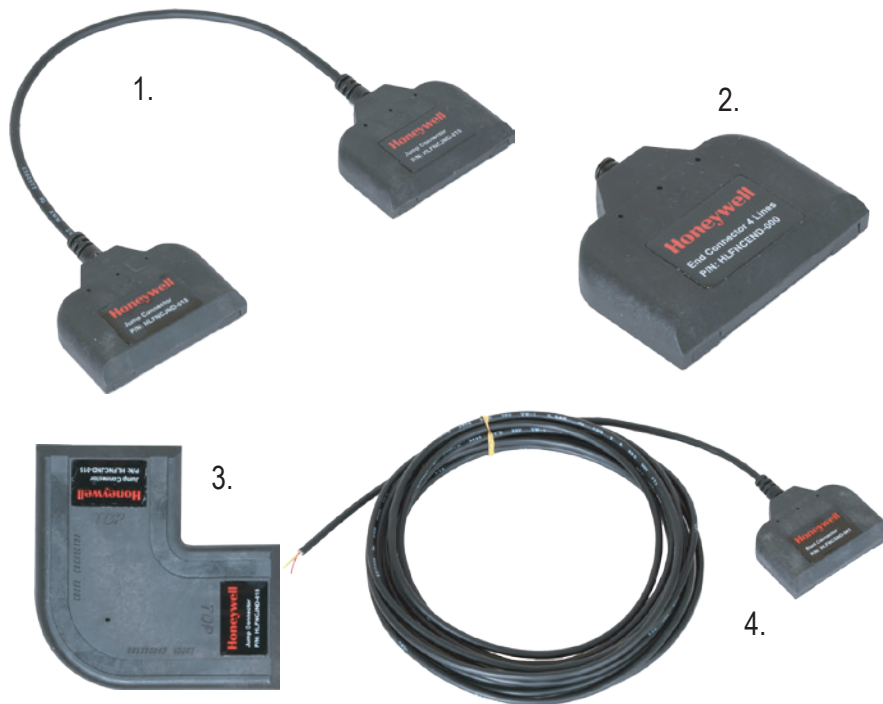

Diagram 4: LeakFilm Connectors

No	Part number	Product Name	Description
1	HLFNCJND-000	Jump Connector	Cable Jump Connector with 15cm Lead Wire
	HLFNCJND-001		Cable Jump Connector with 1m Lead Wire
2	HLFNCENN-000	End Connector 2 Lines	End Connector 2 Lines
3	HLFNCLND-000	Elbow Connector	Elbow Connector
4	HLFNCSND-005	Start Connector	Start Connector with 5 meter Lead Wire

Table 2: LeakFilm Connectors

> *Caution:* **LeakFilm Conductive sensor should be used with 2 lines end connector (HLFNCENN-000). 4 lines end connector is not applicable.**

5. Installation

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WARNINGS

LeakFilm controllers and sensors are designed for installation and use in ordinary areas only. Do not install the controllers and the sensors in hazardous areas.

Installation must be in accordance with the recognised standards of the appropriate authority in the country concerned.

Access to the terminal block for wiring and switches for configuration of the controller, when carrying out any work, must only be conducted by trained personnel.

Before carrying out any work ensure local regulations and site procedures are followed. Appropriate standards must be followed to maintain the overall certifications.

Never attempt to open a plastic enclosure or connector or replace/refit the wire of the sensor while power is still applied to the controller.

LeakFilm controllers must be earthed/grounded for electrical safety and to limit the effects of radio frequency interference. Earth/ground points are provided "F.G." or "SHIELD" terminal of the controllers.

Ensure that all screens/instrument earth/clean earth wiring is earthed/grounded at a single point (either at the controller or master controller - BUT NOT BOTH) to prevent false readings or alarms that may occur due to potential earth/ground loops.

The plastic enclosure of the controllers is a potential electrostatic charging hazard. Avoid any conditions that could result in the controllers becoming electrostatically charged.

Take care when handling LeakFilm sensors as they may be damaged by sharp tools.

LeakFilm controllers should be handled with care to avoid mechanical shock and impact.

Do not expose to temperatures, humidity and other conditions beyond the storage and operating ranges.

LeakFilm controllers must have a suitably rated fuse.

LeakFilm controllers and sensors should be installed in a location free from dust, direct sunlight, temperature extreme, strong magnetic field and heavy vibration.

</div>

5. Installation

5.1 Mounting and Location

LeakFilm 5 is designed to be mounted through 2 mounting holes, so that the user can easily install the controller on a wall or in the interior of an electrical control panel. The following points should be noted when locating the controllers.

- When locating the controllers, consider the possible damage caused by natural events e.g. rain or flooding. LeakFilm 5 is not water proof (IP20).

- Consider ease of access to the controller for repair and maintenance.

- Avoid any location mentioned in the above warnings.

See the installation drawing at the end of this manual for mechanical dimensions.

5.2 Sensor installation

LeakFilm sensor has double sided tape to adhere to the floor or a flat surface. The following points should be noted when installing the sensors.

- The surface should be clean for better adherence to the sensor.

- Glue or adhesive can be used in addition to standard double sided tape if the surface is not flat or not suitable for double sided tape.

5.3 Typical examples of installing the sensor

Overall length of the sensor should be less than 50 meters per channel and overall length of the lead wire should also be less than 50 meters per channel.

Case 1: Standard lead wire and custom length of single sensor

Start Connector
PN: HLFNCSND-005

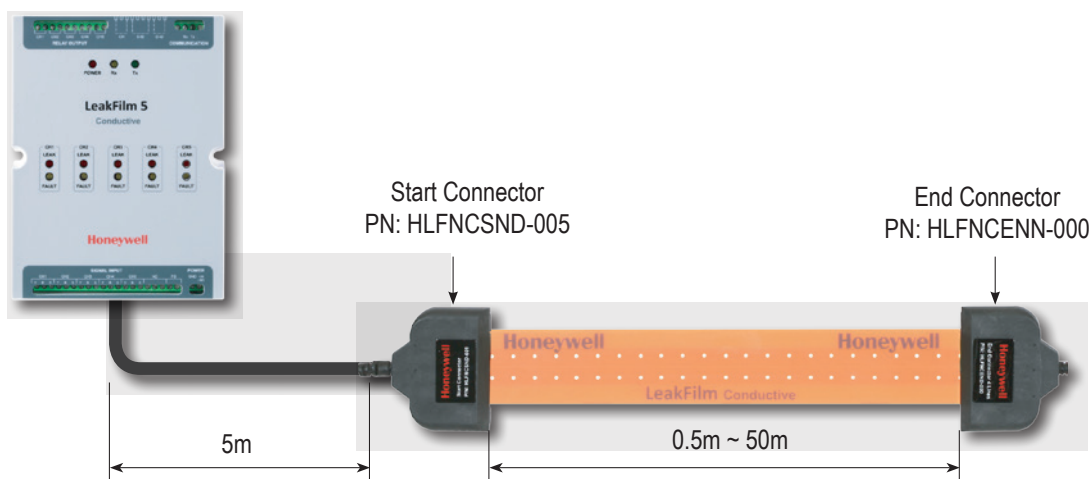End Connector
PN: HLFNCENN-000

5m

0.5m ~ 50m

Diagram 5: Case 1

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5. Installation

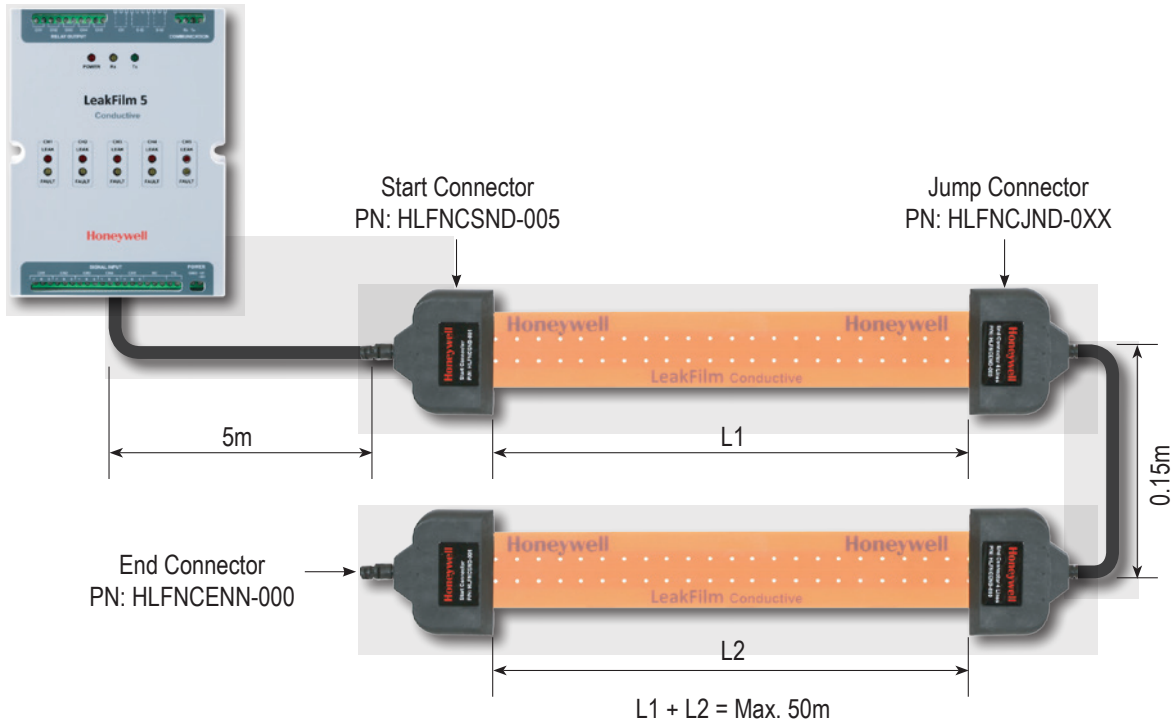*Case 2: Standard lead wires and custom length of multiple sensors*

Diagram 6: Case 2

Case 3: Custom length of lead wire and custom length of single sensor

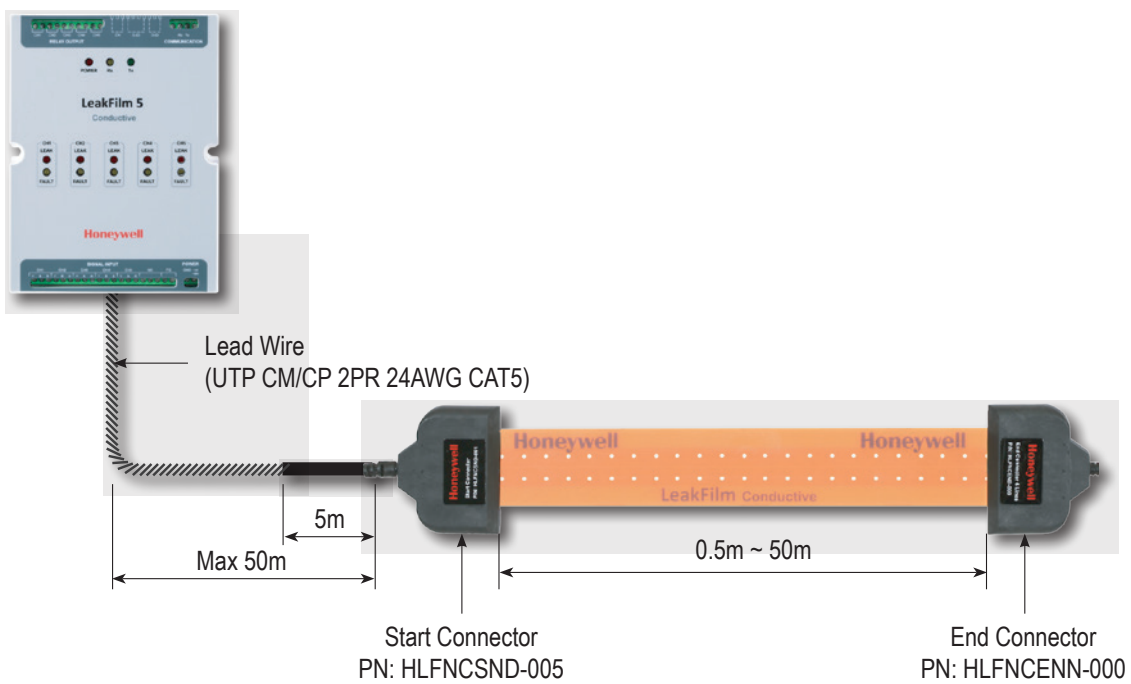*Diagram 7: Case 3*

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5. Installation

Case 4: Custom length of lead wires and custom length of multiple sensors
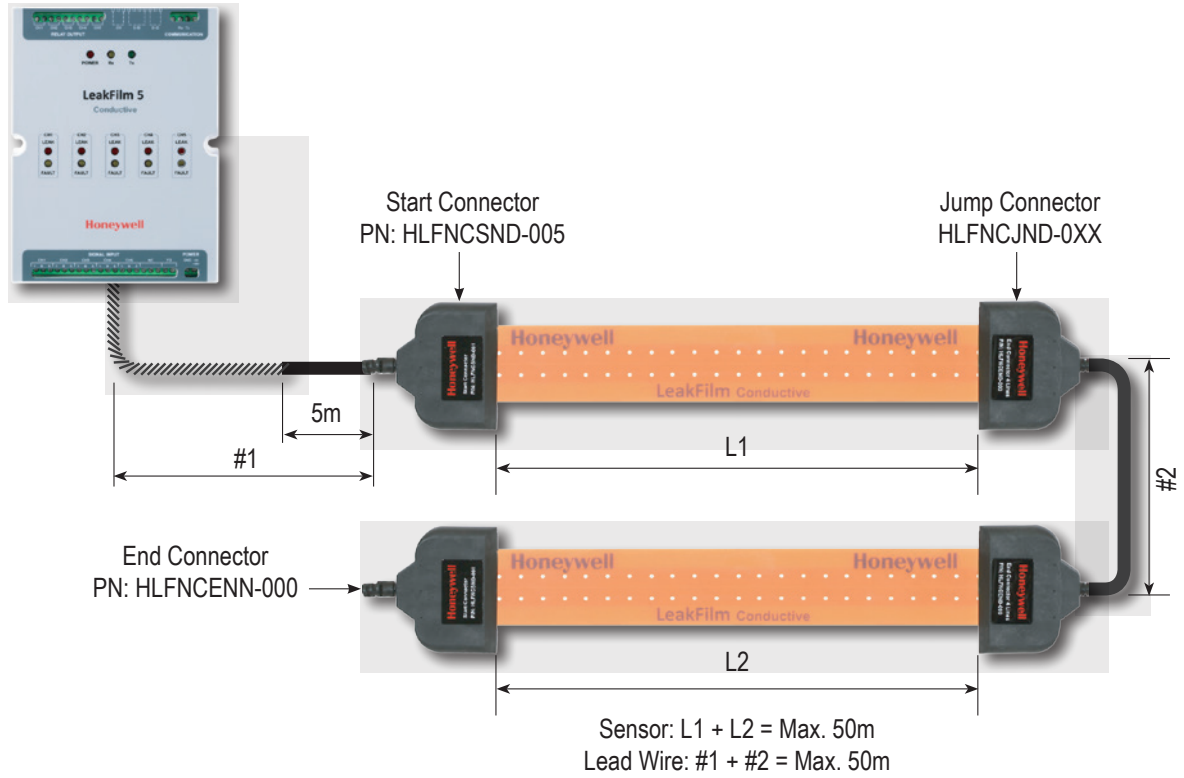
Diagram 8: Case 4

Caution: *Maximum length of sensor and lead wire depends on the sensor and controller type.*

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6. Electrical connections and power on

6.1 Terminal connections
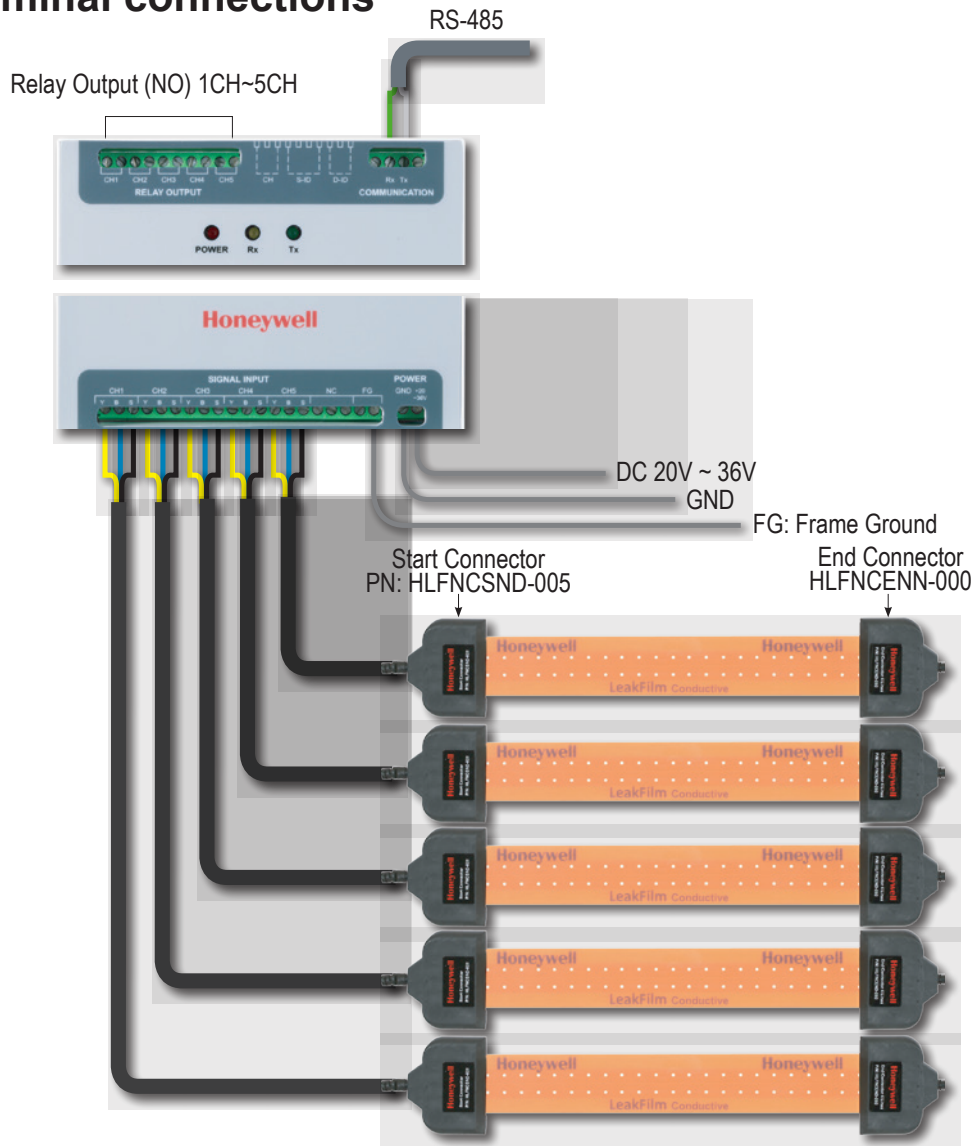
Diagram 9: Wiring Diagram

WARNINGS

All electrical connections should be made in accordance with any relevant local or national legislation, standards or codes of practice.

LeakFilm controllers must be earthed/grounded for electrical safety and to limit the effects of radio frequency interference. Earth/ground points are provided "F.G." or "SHIELD" terminal of the controllers.

All electrical connections must be terminated correctly as per below wiring diagram. Otherwise the controller will not operate properly.

6. Electrical connections and power on

Marking	Group	Description
CH1 – Y	Signal Input	Yellow wire of channel 1 sensor
CH1 – B		Blue wire of channel 1 sensor
CH1 – S		Shield wire of channel 1 sensor
CH2 – Y		Yellow wire of channel 2 sensor
CH2 – B		Blue wire of channel 2 sensor
CH2 – S		Shield wire of channel 2 sensor
……		……
CH5 – Y		Yellow wire of channel 5 sensor
CH5 – B		Blue wire of channel 5 sensor
CH5 – S		Shield wire of channel 5 sensor
NC		Not used
CH1	Relay Output	Channel 1 relay
CH2		Channel 2 relay
……		……
CH5		Channel 5 relay
+12V	Communication	Not used (for future expansion)
Rx		To Rx of LeakFilm MC
Tx		To Tx of LeakFilm MC
0V		Not used (for future expansion)
FG	Power	Frame ground
GND		Ground (0VDC) of power supply
20~36V		+V of power supply. 24VDC Nominal.

Table 3: LeakFilm 5 Controller Terminal Connections

6. Electrical connections and power on

6.2 Connection with LeakFilm MC (Master Controller)

Up to 15 LeakFilm 5 units can be connected to LeakFilm MC using RS-485 communication. All Tx lines should be connected to Tx terminal of J8 of LeakFilm MC and all Rx line to Rx terminal of J8 of LeakFilm MC.
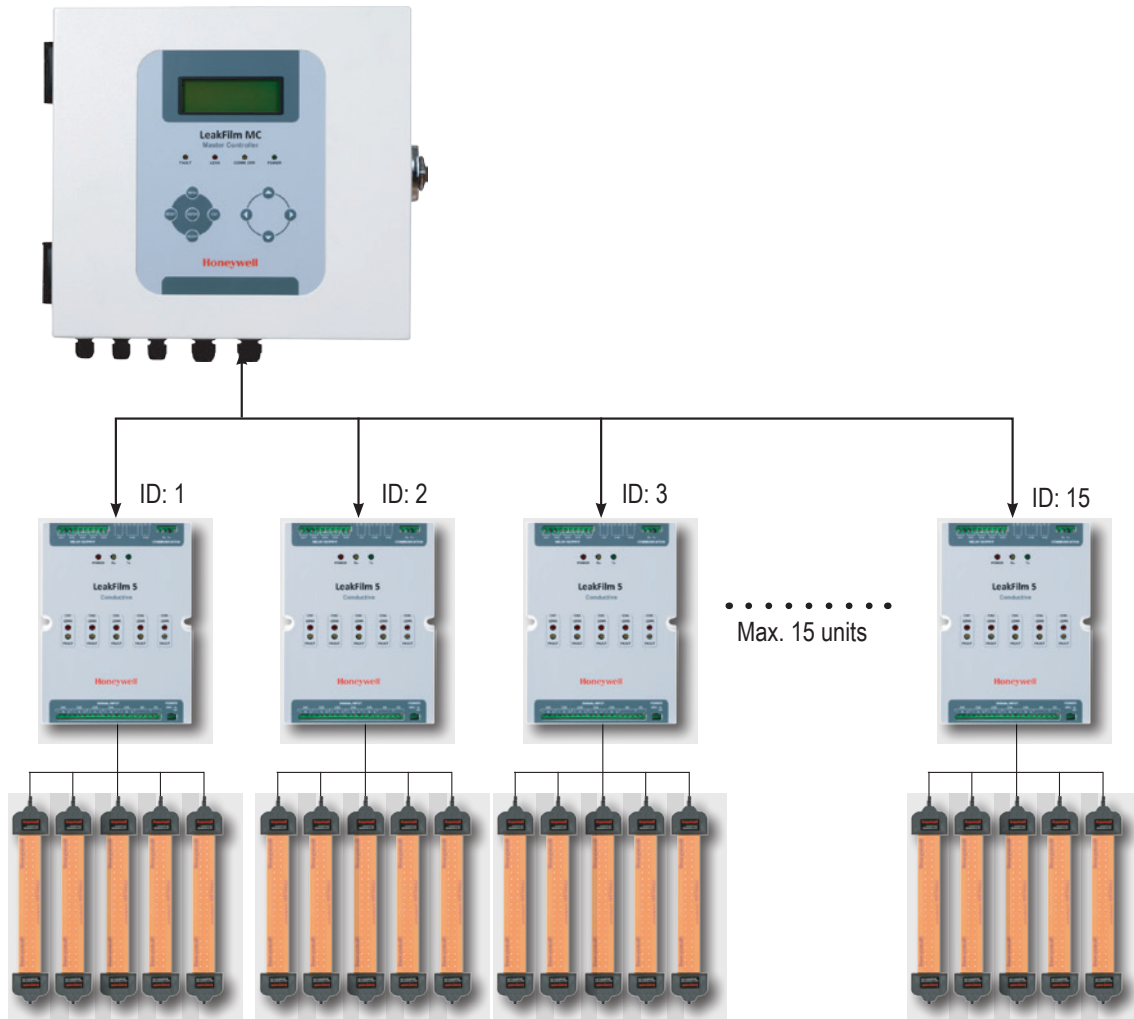
Diagram 10: Wiring Diagram to master controller

ID and channel setting are required for RS-485 communication with the LeakFilm MC. All dip switches of "D-ID" should be "OFF" to enable the RS-485 communication. In diagram 10, all dip switches of "D-ID" are "OFF".

"S-ID" is a controller ID for communication in the range 1 to 15. Each controller connected to the LeakFilm MC should have a unique ID. In diagram 10, "S-ID" is set as 1.

> *Caution: Each controller connected to LeakFilm MC should have a unique communication ID, otherwise incorrect data can be transmitted to the master controller.*

6. Electrical connections and power on

"CHANNEL" determines how many channels are enabled. Maximum "CHANNEL" is 5. In diagram 10 "CHANNEL" is set as 5. If user wants to connect two sensors to the controller, set "CHANNEL" dip switch as 2 (9:ON, 8,10: OFF) and connect the sensors to CH1 and CH2.
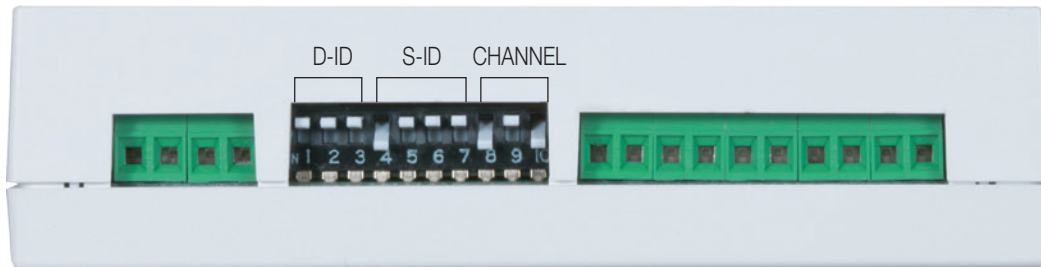
D-ID: All OFF in diagram (1, 2, 3 should be "OFF" to enable RS-485 communication)
S-ID: 1
CHANNEL: 1 + 4 = 5

Diagram 10: ID & CHANNEL Setting

> *Caution: Once you change the setting of dip switch, you should turn on the power again to apply the change to the controller.*

> *Caution: Do not skip a channel when you connect multiple sensors. For 3 channels, connect the sensors to CH1, CH2 and CH3. If you connect CH1, CH2 and CH4, then CH1 and CH2 will work properly but CH3 will have fault and CH4 will not work.*

6. Electrical connections and power on

6.3 Power on (Commissioning)

> *Caution:* **The following procedure should be followed carefully and only performed by suitably trained personnel**

The controller will enter review mode when the "MODE" button is pushed. This mode allows the user to view current date and time, log data and other configurations as shown in the table below. The user can go to the next item by pushing the "MODE" button.

1. Check that all electrical connections are terminated correctly as per the wiring diagram.

2. Set the "CHANNEL" dip switch depending on how many sensors you connected to the controller.

3. Switch on the power supply to the controller.

4. Using a Digital Multi Meter (DMM), check the supply voltage at the terminals GND and 20-36V. The measured voltage should be in the range of 20-36VDC.

5. Switch off and on again.

6. Check that the power LED is on.

7. Check that the buzzer beeps 2 times.

After going through all of the above procedures correctly, LeakFilm can be tested by dropping a small amount of water onto the sensor to check for correct operation.

> *Caution:* **"CHANNEL" dip switch should be set correctly depending on how many sensors are connected to the controller.**

8. Characteristic and specifications

LeakFilm 5

Item	Specification
Applicable sensor	LeakFilm Conductive
Power supply	20 to 36 VDC
Power consumption	Max 4 Watt
LED indication	Green - Power On Yellow - Fault Red - Leak
Sound level	Over 80dB @ 10cm
Output	Relay (NO) per channel - 30 VDC 5A, or 250VAC 5A
Communication	RS485(*MODBUS®)
Communication Function (Status transmission)	• Leak Detection • Leak Clearance • Broken Detection • Broken Clearance
Storage Temperature	-10 to 65 °C
Operating temperature	-10 to 55 °C
Operating humidity	5 to 85 %RH
Sensing length	Min : 0.5 m, Max : 50 m
ID setting	1 to 15
IP rating	IP20
EMC Directive 2004/108/EC	EN61000-6-4/A1:2011, EN61000-6-2:2005, EN61000-3-2/A2:2009, EN61000-3-3:2008,
Electrical Safety	1) Low Voltage Directive 2006/95/EC: EN 61010-1:2010 2) US: UL 61010-1 3rd Edition 3) Canada: CAN/CSA-C22.2 No.61010-1 3rd Edition

* To use the digital communication, please contact a Honeywell Analytics Service Representative for further details.

9. Ordering Information

LeakFilm 5

Part number	Product Name	Description
LeakFilm Controller		
HLFC5CRN	LeakFilm 5	5 Channel Conductive Controller with Broken sensor Detection
LeakFilm Sensor		
HLFSSCNN-100	LeakFilm Conductive	100 meter Conductive Sensor
HLFSSCNN-050		50 meter Conductive Sensor
HLFSSCNN-001		Custom Length Conductive Sensor
LeakFilm Connector		
HLFNCSND-005	Start Connector	Start Connector with 5 meter Lead Wire
HLFNCJND-000	Jump Connector	Cable Jump Connector with 15cm Lead Wire
HLFNCJND-001		Cable Jump Connector with 1m Lead Wire
HLFNCLND-000	Elbow Connector	Elbow Connector
HLFNCENN-000	End Connector 2 Lines	End Connector 2 Lines

9. Warranty Statement

All products are designed and manufactured to the latest internationally recognised standards by Honeywell Analytics under a Quality Management system that is certified to ISO 9001. As such Honeywell Analytics warrants its products against defective parts and workmanship and will repair or (at its option) replace any instruments which are or may become defective under proper use within 18 months from date of commissioning by an approved Honeywell Analytics representative or 24 months from date of shipment from Honeywell Analytics, whichever is the sooner. This warranty does not cover disposable batteries or damage caused by accident, abuse, abnormal operating conditions or poisoning of sensor.

Defective goods must be returned to Honeywell Analytics premises accompanied by a detailed description of any issue. Where return of goods is not practicable Honeywell Analytics reserves the right to charge for any site attendance where any fault is not found with the equipment. Honeywell Analytics shall not be liable for any loss or damage whatsoever or howsoever occasioned which may be a direct or indirect result of the use or operation of the Contract Goods by the Buyer or any Party.

This warranty covers instrument and parts sold to the Buyer only by authorised distributors, dealers and representatives as appointed by Honeywell Analytics. The warranties set out in this clause are not pro rata, i.e. the initial warranty period is not extended by virtue of any works carried out there under.

In no event will Honeywell Analytics be liable for any incidental damages, consequential damages, special damages, punitive damages, statutory damages, indirect damages, loss of profits, loss of revenues, or loss of use, even if informed of the possibility of such damages. Honeywell Analytic's liability for any claims arising out of or related to this product will in no case exceed the order value. To the extent permitted by applicable law, these limitations and exclusions will apply regardless of whether liability arises from breach of contract, warranty, tort (including but not limited to negligence), by operation of law, or otherwise.

11. Installation Drawing

11. Installation Drawing

LeakFilm 5

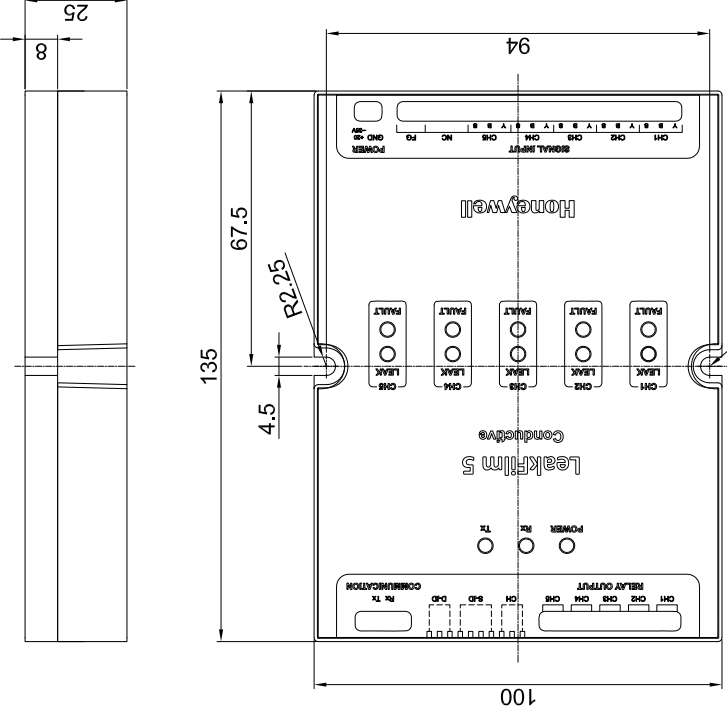| Terminal	No	Function
Power In	1	DC 20V-36V
Power In	2	GND
1CH Sensor In	3	Yellow Line
1CH Sensor In	4	Blue Line
1CH Sensor In	5	Shield
2CH Sensor In	6	Yellow Line
2CH Sensor In	7	Blue Line
2CH Sensor In	8	Shield
3CH Sensor In	9	Yellow Line
3CH Sensor In	10	Blue Line
3CH Sensor In	11	Shield
4CH Sensor In	12	Yellow Line
4CH Sensor In	13	Blue Line
4CH Sensor In	14	Shield
5CH Sensor In	15	Yellow Line
5CH Sensor In	16	Blue Line
5CH Sensor In	17	Shield
NC	18	Not used
NC	19	Not used
NC	20	Not used
Frame Ground	21	Frame Ground
Frame Ground	22	Frame Ground
Relay	23	RLY1CH COM
Relay	24	RLY1CH NO
Relay	25	RLY2CH COM
Relay	26	RLY2CH NO
Relay	27	RLY3CH COM
Relay	28	RLY3CH NO
Relay	29	RLY4CH COM
Relay	30	RLY4CH NO
Relay	31	RLY5CH COM
Relay	32	RLY5CH NO
-	33	Not used
Serial Comm	34	RS 485 Rx
Serial Comm	35	RS 485 Tx
-	36	Not used
Connector	37	Start "HLFNCSND-005"
Sensor	38	LeakFilm Conductive
Connector	39	End "HLFNCENN-000"

LeakFilm 5

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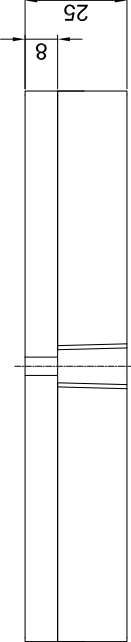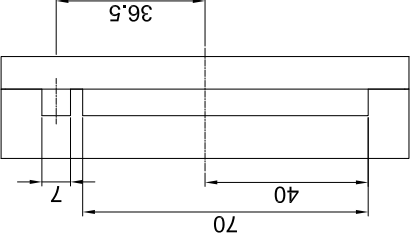
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3013G0803
SCALE NONE
SHT. 2 OF 2   A3

	ISSUE	DATE	CHANGE		APPROVED BY
	2	15/May/14	Drawing Change		Jeffrey L.
	1	11/Mar/14	New Design		Jeffrey L.

MATERIAL

FINISH

TOLERANCES TO BE AS SPECIFIED BELOW UNLESS OTHERWISE STATED.
DIMS.   2 DP ± 0.1 mm
        1 DP ± 0.25 mm
        NONE ± 0.4 mm
ANGULAR ± 1/2 °
HOLES. 0 to 8   + 0.08 - 0.0
        8 to 14   + 0.1   - 0.0
        14 to 25 + 0.12 - 0.0

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED. AND APPLY AFTER PLATING
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Find out more

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