Standardized Information for Process/Product Change Notification (PCN) Based on the JEDEC Standard JESD46 standard (latest release)

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1. PCN basic data		
1.1 Company	LEM International SA Route du Nant d'Avril 152 1217 Meyrin Switzerland	
1.2 PCN No.	**PCN-056_2024_1-OMTG21018I (UPDATE with date code)**	
1.3 Title of PCN	Mechanical and electronic redesign	
1.4 Product Category	Electronic module - Current sensor	
1.5 Issue date	**8/28/2024**	
1.6 PCN revision history (optional)	**1.7 Issue date of previous revision (optional)**	**1.8 Delta to previous revision (optional)**

2. PCN Team		
2.1 Contact supplier		
2.1.1 Name	Saravanakkumar Arumugam - Product Life Cycle Coordinator	
2.1.2 Phone		
2.1.3 Email	Srm@lem.com	
2.2 Team supplier (optional)		
2.2.1 Name (optional)	**2.2.2 Phone (optional)**	**2.2.3 Email (optional)**
Stéphane Rollier - Product Life Cycle	0041227061449	sro@lem.com

3. Changes			
No.	**3.0 Ident**	**3.1 Category**	**3.2 Type of change**
#1	**SEM-AN-01**	ANY	Any change with impact on agreed upon contractual agreements
#2	**SEM-DS-01**	DATA SHEET	Change of datasheet parameters/electrical specification (min./max./typ. values) and/or AC/DC specification
#3	**SEM-DE-01**	DESIGN	Design changes in active elements.
#4	**SEM-DE-04**	DESIGN	Firmeware modification
#5	**SEM-PA-13**	PROCESS - ASSEMBLY	Change of product marking
#6	**SEM-PA-16**	PROCESS - ASSEMBLY	Change of direct material supplier

#7	**SEM-PA-17**	PROCESS - ASSEMBLY	Change of specified assembly process sequence (deletion and/or additional process step)

4. Description of change		
	Old	**New**
Change #1	See sheet "Changes description"	Mechanical evolution: Different coil/measuring head assembly with different various mechanical parts to simplify the complete mounting. New case version to receive the different assembly of the coil/measuring head and new PCBA module. As per sheet "Changes description".
Change #2	See sheet "Changes description"	Current consumption change. Fluxgate excitation signal frequency modification. Starting time improvement. UR marking. Description as per sheet "Changes description"
Change #3	See sheet "Changes description"	Electronic design evolution: Create platform design based on FPGA vs microcontroller: Modular and scalable architecture leading to components change: Different components, new PCBA layout, and aluminium heatsink replacement. Description as per sheet "Changes description"
Change #4		SW update.
Change #5	See sheet "Changes description"	UR certification: UR marking. Description as per sheet "Changes description".
Change #6		PCB & PCBA suppliers change: PCB material used by the new PCB supplier being the same material as used by the previous PCB supplier. Second source magnetic circuit supplier: Magnetic material used by the second source magnetic circuit supplier being the same material as used by the current magnetic circuit supplier.
Change #7		Slight assembly process adaptation due to changes 1 and 3.
4.1 Anticipated impact on form, fit, function, reliability or processability?	No impact on fit, reliability, quality and functional safety. Impacts on form (marking), function, data sheet, process as described per the changes 1, 2, 3, 4, 5 and 7.	
4.2 Reference parts with customer number (optional)		

5. Reason / motivation for change	
5.1 Motivation	Changes 2, 3, 4 and 7: - Electronic design robustness improvement (heat dissipation improvement), - Components availability and longer lifetime of the product (FPGA use among others), to secure supply chain, avoid shortages on deliveries. Change 6: Global supplier strategic relocation aiming at decarbonization, logistic improvement and de-risking Supply Chain. Changes 1, 3 and 7: Assembly process simplification. Change 5: UR Certification required by the market.
5.2 Additional explanation (optional)	

6. Marking of parts / traceability of change	
6.1 Description	UR marking added Traceability ensured by datecode.

7. Timing / schedule		
7.1 Date of qualification results	**11/18/2024**	
7.2 Last order date (optional)		
7.3 Last delivery date (optional)		
7.4 Intended start of delivery	**2/1/2027**	
7.5 Qualification samples available?	Available	
7.6 Customer feedback required until	**10/11/2024**	

8. Qualification / validation				
8.1 Description (e.g. qual. plan/report, AEC-Q...)	Qualification plan available as per file called "TestPlanPV_IN1000_S_V0 August 2024"			
8.2 Qualification report and qualification results	will be available at date	**issue date**	**11/18/2024**	

9. Input to customer for risk assessment process
Not applicable

10. Attachments (e.g. new datasheet, additional documentation, pictures, process flow, sample plan, ...)
Not applicable

11. Affected parts	
11.1 Current	**11.2 New (if applicable)**

11.1.1 Customer Part No.	11.1.2 Supplier Part Name	11.1.3 Supplier Part No. (optional)	11.1.4 Package Name	11.1.5 Part Description (optional)	11.1.6 Additional Part Information (optional)	11.2.2 Supplier Part Name	11.2.3 Supplier Part No. (optional)	11.2.4 Package Name	11.2.6 Additional Part Information (optional)
	IN 500-S								
	IN 500-S CAL								
	IN 1000-S								
	IN 1200-S								
	IN 1200-S CAL								
	IN 1200-S								
	IN 1500-S								

Customer Feedback/Approval Form

Title of PCN:			
Mechanical and electronic redesign			
Customer PCN No.		**Supplier PCN No.**	**PCN-056_2024_1-OMTG21018I (UPDATE with date code)**
Please check the appropriate box below:			

1. feedback to be provided within 3 weeks after the reception of the PCN.

☐	**1. Feedback**	**date:**	
☐	**We agree with this proposed change for the parts as listed in chapter '11. Affected parts'. Approval letter will be sent in written form.**		
☐	**We agree with this proposed change schedule and will start with the PCN process. Approval letter will be sent in written form after evaluation.**		
☐	**We disapprove because:**		
☐	**Remark:**		

2. feedback to be provided within 6 weeks after the reception of the PCN.

☐	**2. Feedback**	**date:**	
☐	**We acknowledge qualification / validation as assigned in chapter 8 of the PCN.**		
☐	**We need more information:**		
☐	**We need the following samples:**		
☐	**Estimated closing date for PCN:**		

☐	**Final Feedback/Approval**	**date:**	

Sender:

Company:	
Name:	
Address/Location:	
Signature:	
Date:	

Please return to: [your Sales partner]	
Name:	Saravanakkumar Arumugam - Product Life Cycle Coordinator
Address/Location:	
Phone:	
Fax:	
Email:	Srm@lem.com

In case LEM does not receive any feedback within 6 weeks at the latest after PCN notification, LEM will assume:

- Customer acceptance to the change

- No need for samples

- No additional need

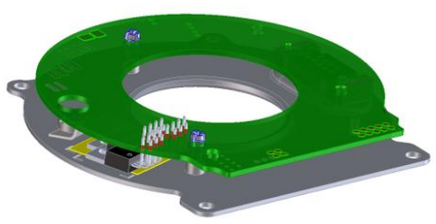
1. feedback to be provided within 3 weeks after the reception of the PCN.
2. feedback to be provided within 6 weeks after the reception of the PCN.

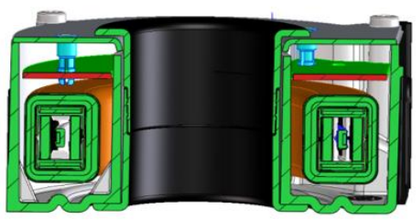
In case LEM does not receive any feedback within 6 weeks at the latest after PCN notification, LEM will assume:
- Customer acceptance to the change
- No need for samples
- No additional need

Based on the JEDEC Standard JESD46 standard (latest release)

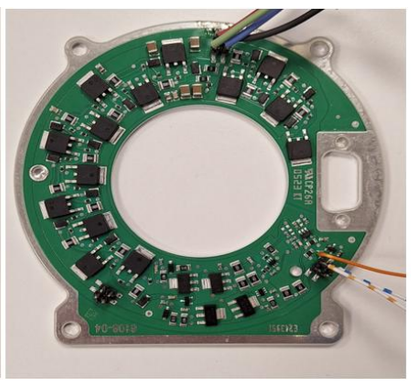
Changes description

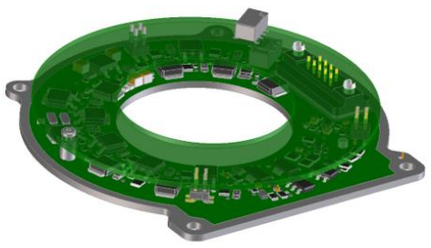
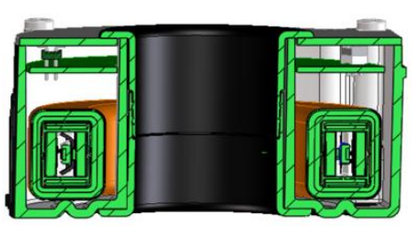
Changes 1 and 3:
Before:
Single 6-layer FR4 Board + aluminium heatsink
Size 96.5mm x 97.75 mm
Components nb: 855
Processor Unit: 32-bit microcontroller
Secondary current was pushed by single IC (Operational Amplifier) mounted on an aluminium cover for heat dissipation



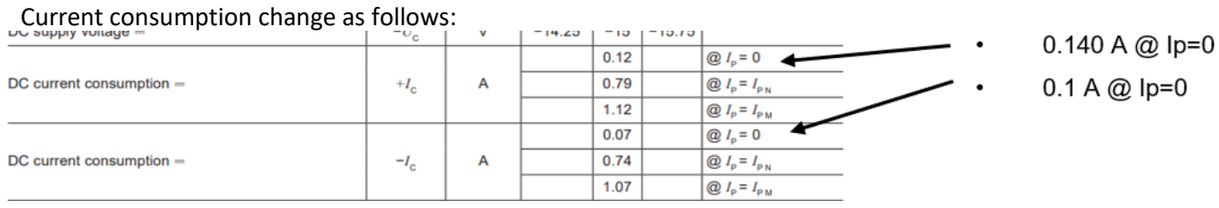

After: Redesign: Main change being the replacement of microcontroller by FPGA:
New PCBA layout and different components
Single 6-layer FR4 Board
Size: 96.5mm x 96.5 mm
Components nb: 944
Processor Unit: FPGA
IMS Board (Insulating Metal Substrate) using 14 transistors to replace 1 Operational Amplifier (for better heat dissipation) (output signal)
Size: 102 mm x 104 mm
Components nb: 222


Different coil/measuring head assembly with some different various mechanical parts to simplify the complete mounting.
New case version to receive the different assembly of the coil/measuring head and new PCBA module.
Slight assembly process adaptation.

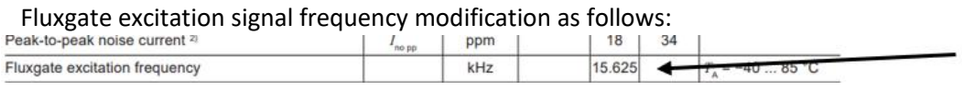
Changes 2:
Current consumption change as follows:



DC supply voltage [1]	$-U_C$	V		−14.25	−15	−15.75
DC current consumption [1]	$+I_C$	A		0.12		@ $I_P = 0$
				0.79		@ $I_P = I_{PN}$
				1.12		@ $I_P = I_{PM}$
DC current consumption [1]	$-I_C$	A		0.07		@ $I_P = 0$
				0.74		@ $I_P = I_{PN}$
				1.07		@ $I_P = I_{PM}$

- 0.140 A @ Ip=0
- 0.1 A @ Ip=0

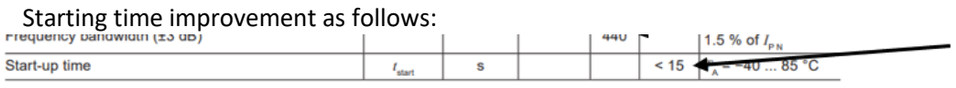
Fluxgate excitation signal frequency modification as follows:



Peak-to-peak noise current [2]	$I_{no\ pp}$	ppm		18	34	
Fluxgate excitation frequency		kHz		15.625		T_A = -40 ... 85 °C

- 32.250 kHz

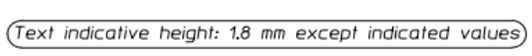
Starting time improvement as follows:



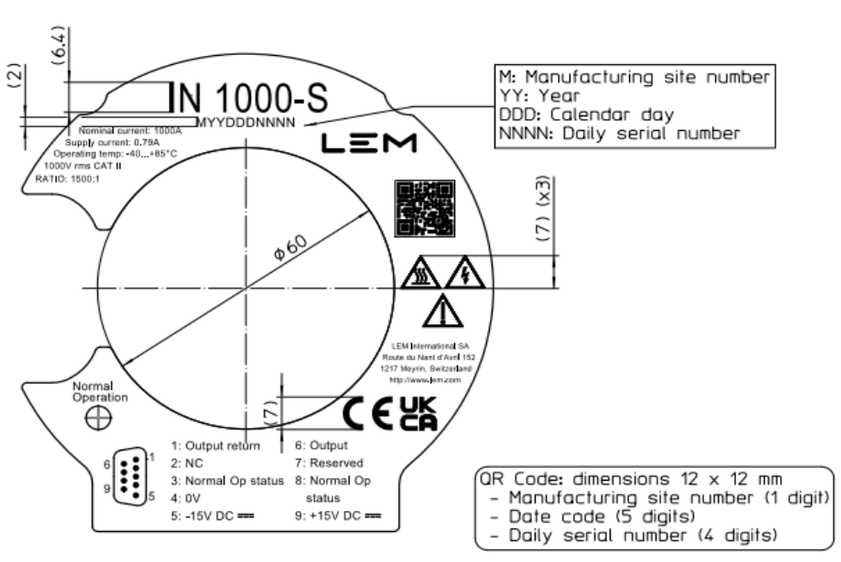
Frequency bandwidth (±3 dB)				440		1.5 % of I_{PN}
Start-up time	t_{start}	s			< 15	T_A = -40 ... 85 °C

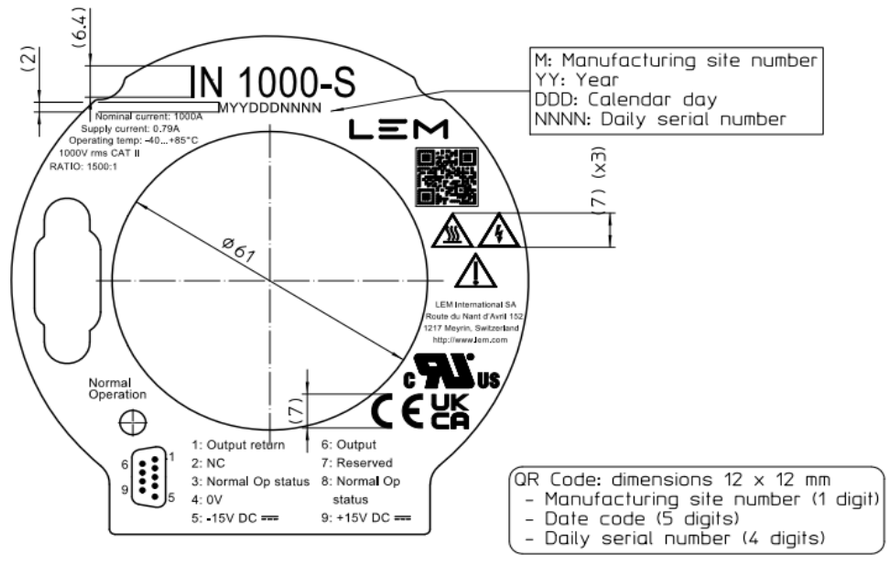
- <1 sec

Change 5 : UR certification: UR marking: Label marking as follows:
Before :



After:
Text indicative height: 1.8 mm except indicated values


(6.4)
(2)
IN 1000-S
MYYDDDNNNN
Nominal current: 1000A
Supply current: 0.79A
Operating temp: -40...+85°C
1000V rms CAT II
RATIO: 1500:1
LEM
M: Manufacturing site number
YY: Year
DDD: Calendar day
NNNN: Daily serial number
(7) (x3)
ø60
(7)
LEM International SA
Route du Nant d'Avril 152
1217 Meyrin, Switzerland
http://www.lem.com
Normal Operation
1: Output return
2: NC
3: Normal Op status
4: 0V
5: -15V DC ⎓
6: Output
7: Reserved
8: Normal Op status
9: +15V DC ⎓
QR Code: dimensions 12 x 12 mm
- Manufacturing site number (1 digit)
- Date code (5 digits)
- Daily serial number (4 digits)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	Short Description	Old Design	New Design
1	IN500-S	90.N6.50.000.0	90.N6.50.100.0
2	IN500-S/SP1CT500	90.n6.50.001.0	90.N6.50.101.0
3	IN1000-S	90.N6.60.000.0	90.N6.60.100.0
4	IN1000-S/SP1	90.N6.60.001.0	90.N6.60.101.0
5	IN1000-S/SP2CT1000	90.n6.60.002.0	90.N6.60.102.0
6	IN1200-S	90.N6.62.000.0	90.N6.62.100.0

Life Energy Motion

IN500-1K series
Mechanical and electronic redesign

PCN-056_2024_0-OMTG21018I

1- Data sheet change

1- Data sheet change

- Current consumption change.
- Fluxgate excitation signal frequency modification.
- Starting time improvement.
- UR marking.

1- Data sheet change

Current consumption change as follows:

DC supply voltage	$-U_C$	V	−14.25	−15	−15.75	
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Fluxgate excitation signal frequency modification as follows:

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Starting time improvement as follows:

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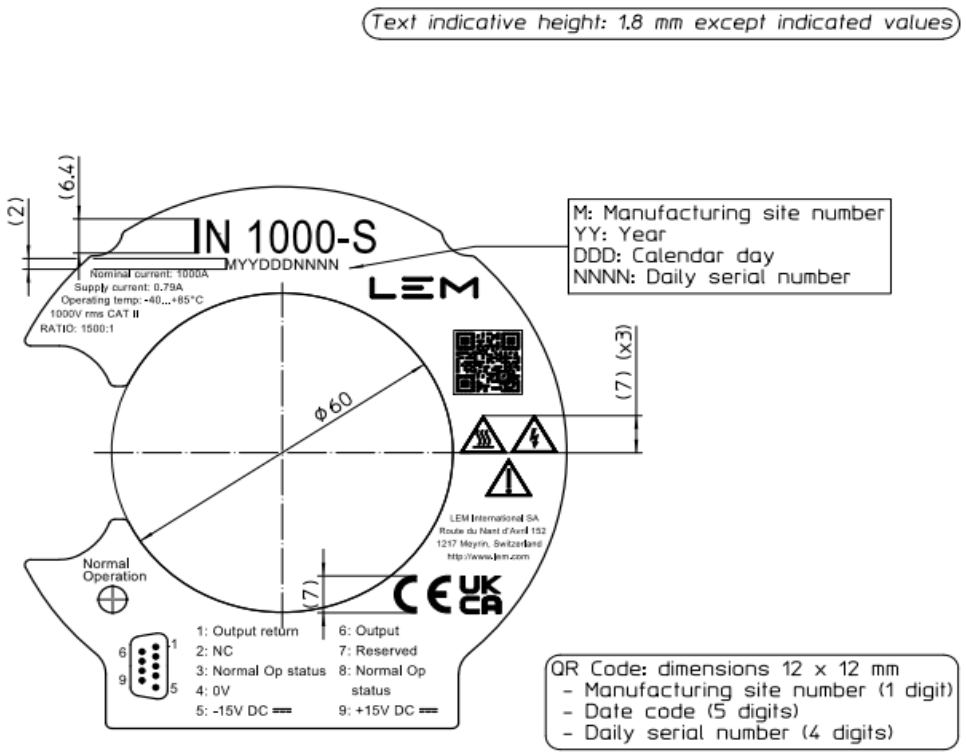
- <1 sec

1- Data sheet change

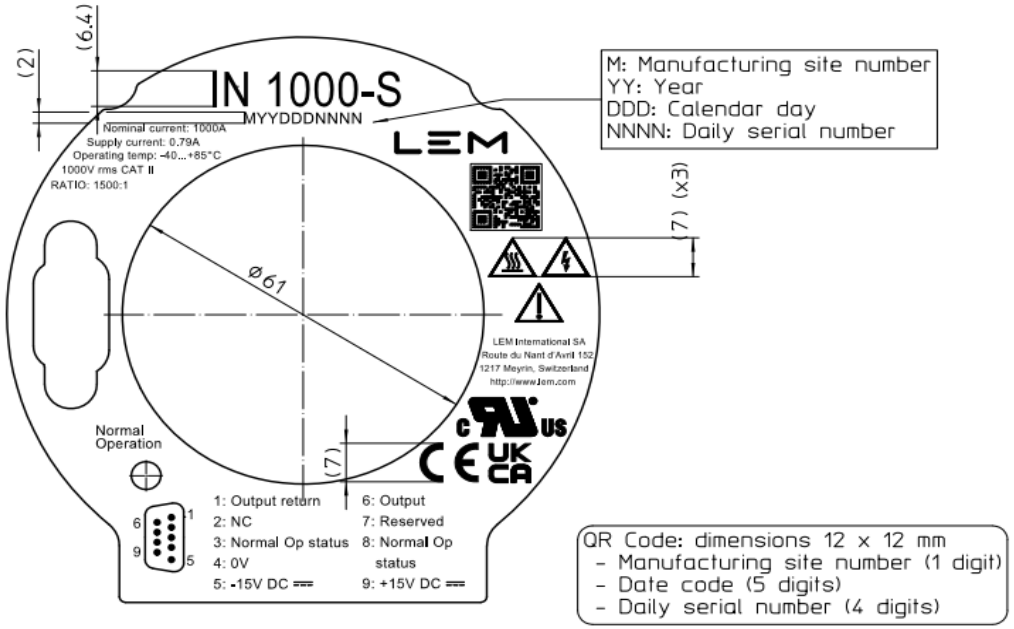
UR certification: UR marking: Label marking as follows:

Before



After

Text indicative height: 1.8 mm except indicated values



2- PCB & PCBA & Magnetic Circuit suppliers change

2- PCB & PCBA & Magnetic Circuit suppliers change

- PCB material used by the new PCB supplier being the same material as used by the previous PCB supplier.
- Second source magnetic circuit supplier: Magnetic material used by the second source magnetic circuit supplier being the same material as used by the current magnetic circuit supplier.