iC-PV EVAL PV1M1
EVALUATION KIT DESCRIPTION

preliminary

ORDERING INFORMATION

Type	Order Designation	Description Options
Evaluation kit	iC-PV EVAL PV1M1	Populated with iC-PV and iC-MHM in QFN package Ready-to-operate, supplied with magnet, CR1025 battery, adapter cable
Evaluation Software	iC-MHM GUI	GUI Software for Windows PC Device setup file generation, board configuration via adapter
Related parts	(to be ordered separately)	
PC adapter	iC-MB3 iCSY MB3U-I2C	PC-USB adapter for BiSS/SSI w. I2C/SPI extension cable
	iC-MB4 iCSY MB4U	High-Performance PC-USB adapter for BiSS C
	iC-MB5 iCSY MB5U	High-Performance isolated PC-USB adapter for BiSS C

BOARD PV1M1

Figure 1: PV1M1 with iC-PV on top side.

PLUG CONFIGURATION

J2 BiSS connector (10-pole)
J1 Optional test connector

SENSOR COMPONENTS

U1 iC-MHM
U2 iC-PV

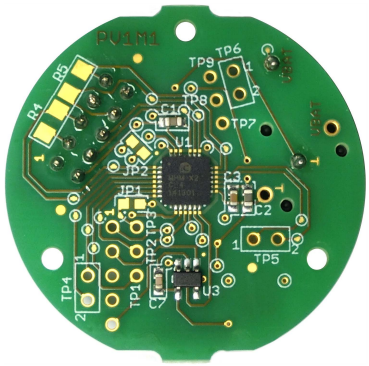

Figure 2: PV1M1 with iC-MHM on bottom side.

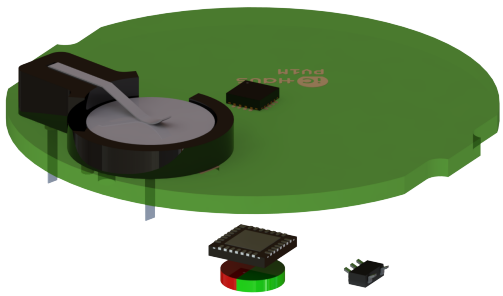

Figure 3: Location of the components

RELATED PRODUCTS AND DOCUMENTATION

- IC Documentation
  → www.ichaus.de/PV_datasheet_en
  → www.ichaus.de/MHM_datasheet_en
  → www.ichaus.de/MHM_AN2_appnote_en
- GUI Software for Windows PC
  → http://www.ichaus.de/MHM_gui_rte
  → http://www.ichaus.de/MHM_gui
- BiSS-to-PC Adapter Descriptions
  → http://www.ichaus.de/MB3U-I2C_datasheet_en
  → http://www.ichaus.de/MB4U_datasheet_en
  → http://www.ichaus.de/MB5U_datasheet_en

OVERVIEW OF KIT ITEMS

Figure 4: Evaluation kit. Scope of delivery: PV1M1 module, CR1025 battery, diametric 4 mm NdFeB magnet, BiSS adapter cable.

Figure 5: End-of-shaft application example

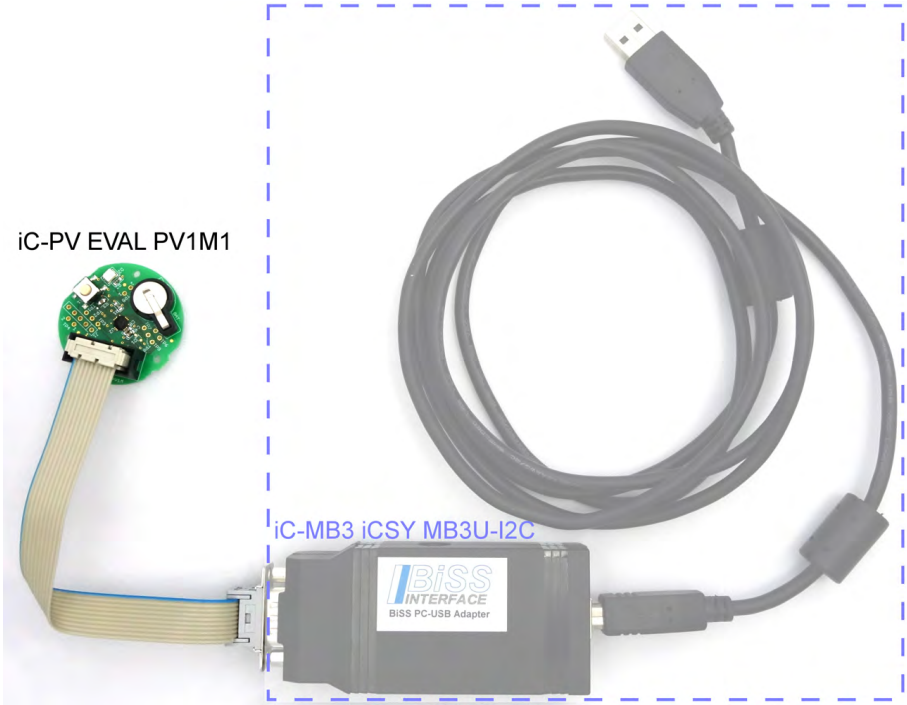

Figure 6: Application of evaluation kit, iC-MB3 iCSY MB3U-I2C has to be ordered separately.

DESCRIPTION OF CONNECTORS

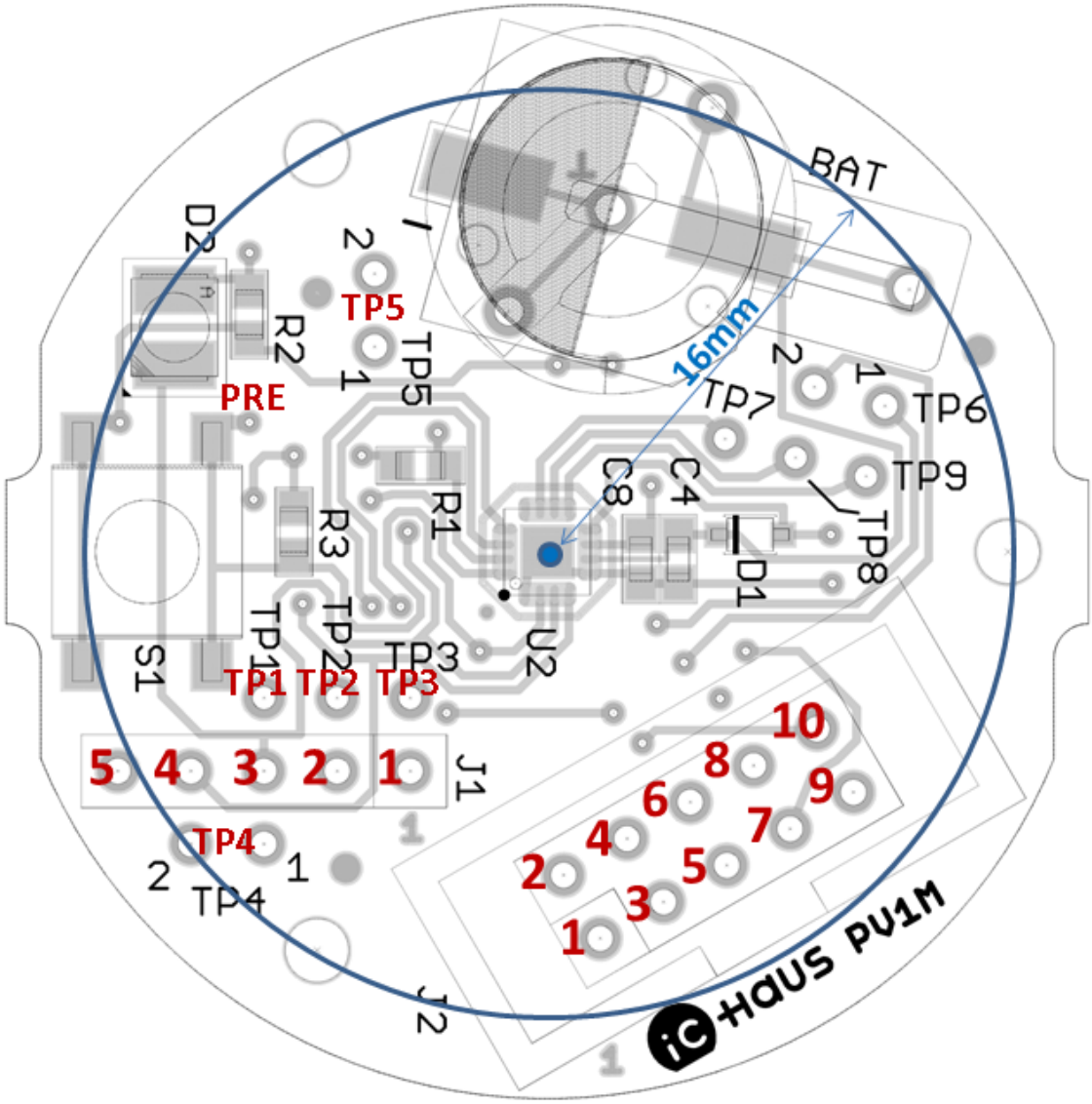

Figure 7: Footprint of PV1M1 (top view)

J2: BiSS connector to PC- USB adapter
(10-pole ribbon connector for adapter cable to Sub-D)

Pin	Sub-D	Name	Function
J2-1	n.c.		Not connected
J2-2	6	GND	Ground
J2-3	2	MA	Clock
J2-4	7	SLO	Data Out
J2-5	3	NMA	Clock (inverted)
J2-6	8	NSLO	Data Out (inverted)
J2-7	4	VDD	+5 V Supply
J2-8	9	SLI	Opt. Data In
J2-9	5	NSLI	Opt. Data In (inverted)
J2-10	NC	NCS	Opt. Not Chip Select (SPI)[1]

J1: Test connector

Pin	Name	Function
J1-1	MCL	Multiturn Interface Clock Line
J1-2	MDI	Multiturn Interface Data Line
J1-3	NERR	Error Output (negative polarity)
J1-4	SDA	I2C Data Line
J1-5	SCL	I2C Clock Line

TPx: Test terminals

TP1	P1	Digital I/O port 1 iC-MHM
TP2	P2	Digital I/O port 2 iC-MHM
TP3	P3	Digital I/O port 3 iC-MHM
TP4	SIN	Analog Sine iC-MHM (differential)
TP5	COS	Analog Cosine iC-MHM (differential)
PRE	PRE	Preset Pin iC-PV

BiSS ADAPTER CABLE

Figure 8: BiSS adapter cable

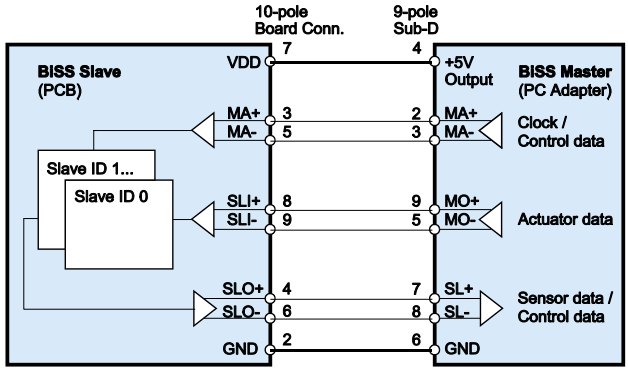

Figure 9: Typical BiSS slave to master connection

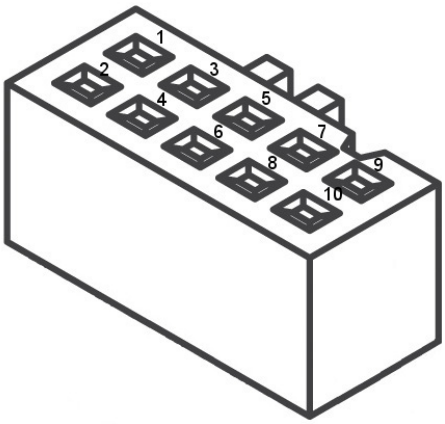

Figure 10: 10-pole connector (to board)

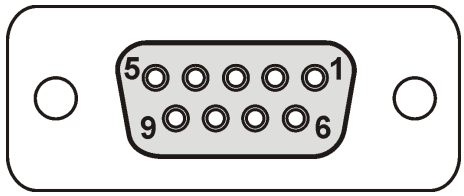

Figure 11: BiSS 9-pole Sub-D connector (to PC-USB adapter)

Connector to Board
(10-pole ribbon)

Pin	Name	Function
1	n.c.	(not connected)
2	GND	Ground
3	MA +	Clock Input
4	SLO +	Slave Data Output
5	MA -	Clock Input, inverted
6	SLO -	Slave Data Output, inverted
7	VDD	+5 V Sensor Supply
8	SLI +	Opt. Data In
9	SLI -	Opt. Data In, inverted
10	NCS[1]	Opt. Not Chip Select (SPI)

BiSS Connector to PC-USB Adapter
(9-pole Sub-D)

Pin	Slave	Master	Function
1	n.c.	(VB)	(12 V Sensor Supply Output)
2	MA +	MA +	Clock Line
3	MA -	MA -	Clock Line, inverted
4	VDD	VDD	+5 V Sensor Supply Output
5	SLI -	MO -	Master Data Output, inverted to Slave Data Input, inverted
6	GND	GND	Ground
7	SLO +	SL +	Data Line
8	SLO -	SL -	Data Line, inverted
9	SLI +	MO +	Master Data Output to Slave Data Input

[1] iC-MHM offers SPI interface mode. The *Not Chip Select* (NCS) of the SPI interface can be connected to J2-10 by closing JP2 (see Figure 15).

CIRCUIT SCHEMATIC

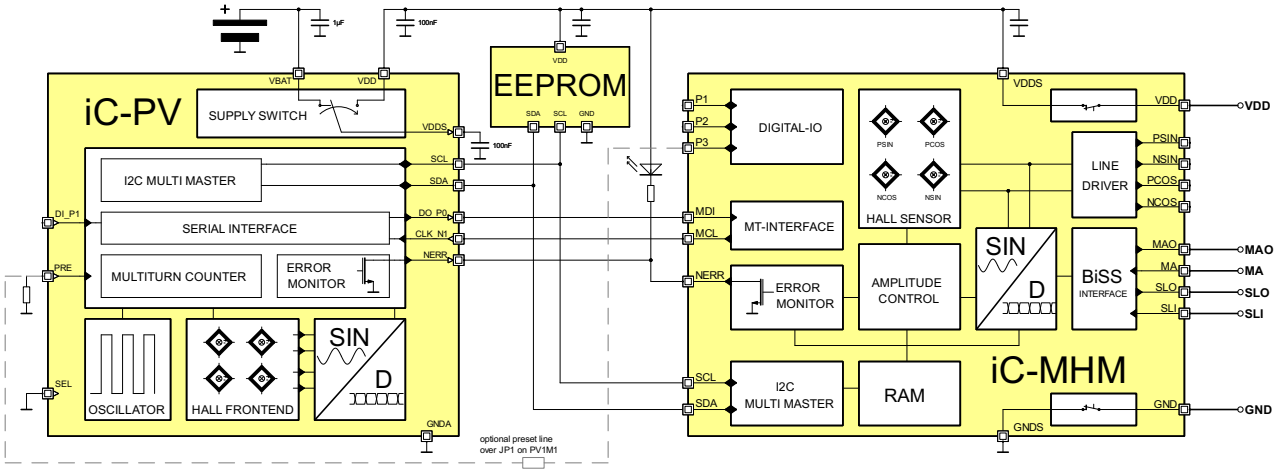

Figure 12: Circuit principle. Connection of iC-MHM pin P3 to iC-PV pin PRE using JP1 is optional.

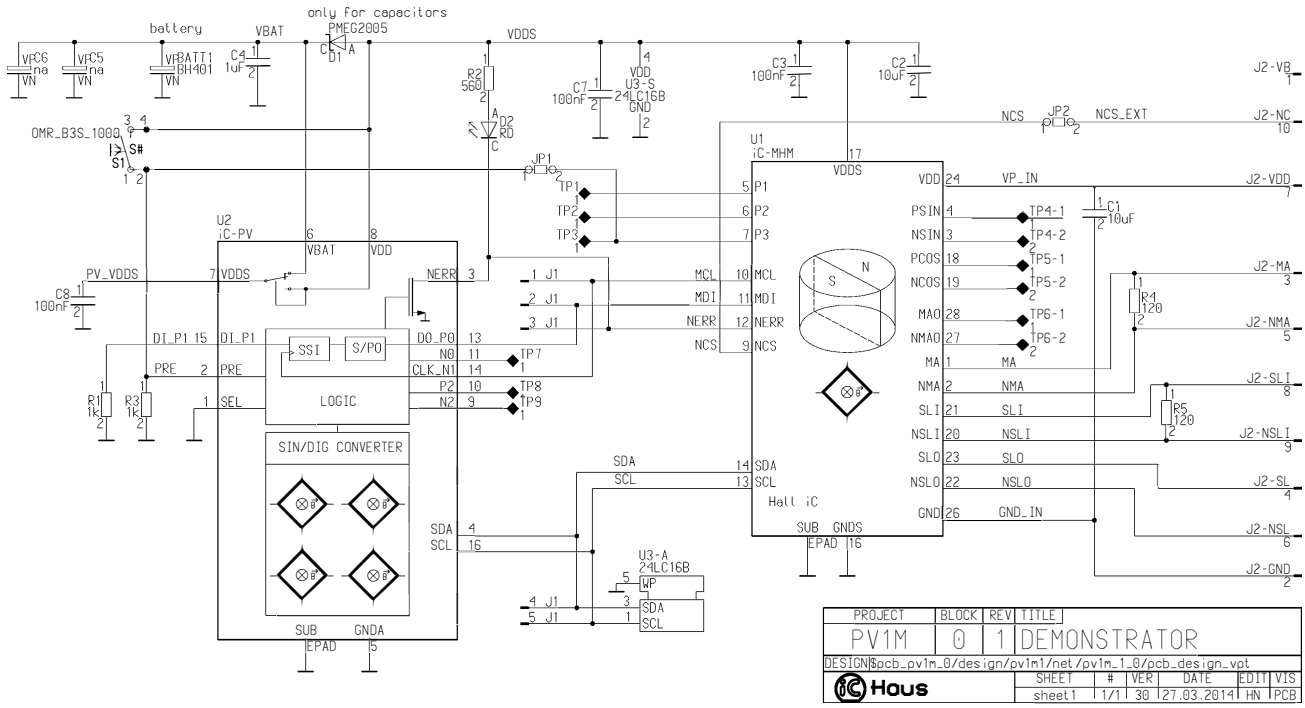

Figure 13: Circuit diagram. Do not install diode D1 for use with battery.

ASSEMBLY PART LIST

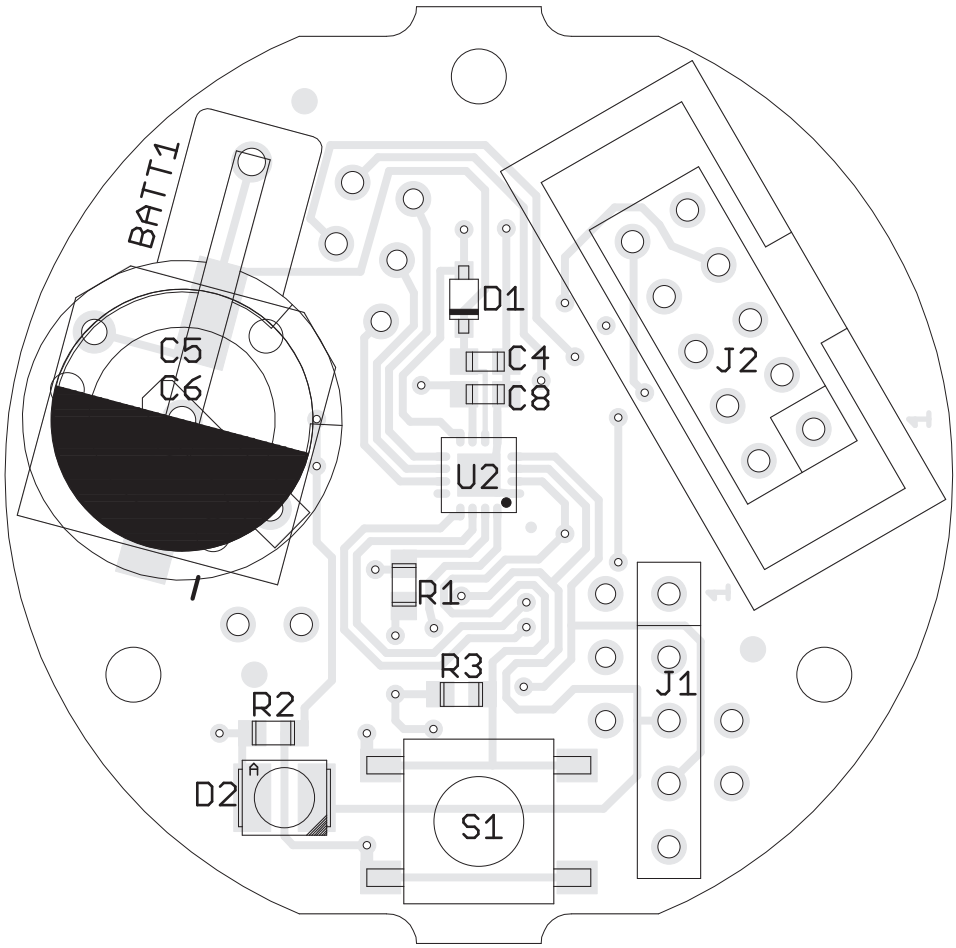

Figure 14: PV1M1 top side

ASSEMBLY PART LISTING: Top Side							
Device	**Type**	**Count**	**Value**	**Tol.**	**Comment**	**Assy Type**	**Package Outline**
C4	C	1	1 µF	10%	X7R 10V	SMD	0603
C5, C6	C	0			not assembled		
C8	C	1	100 nF	10%	X7R 10V	SMD	0603
D1	D	0	PMEG2005		not assembled	SMD	SOD323
D2	D	1	LS-T67K		red	SMD	PLCC2
J1	CONN	0			not assembled	TH	X4x1
J2	CONN	1	WSL10G			TH	W5x2
R1, R3	R	2	1 kΩ	1%		SMD	0603
R2	R	1	560 Ω	1%		SMD	0603
S1	Switch	1	B3S-1000			SMD	0603
U2	IC	1	iC-PV			SMD	QFN16

Table 1: Part listing top side

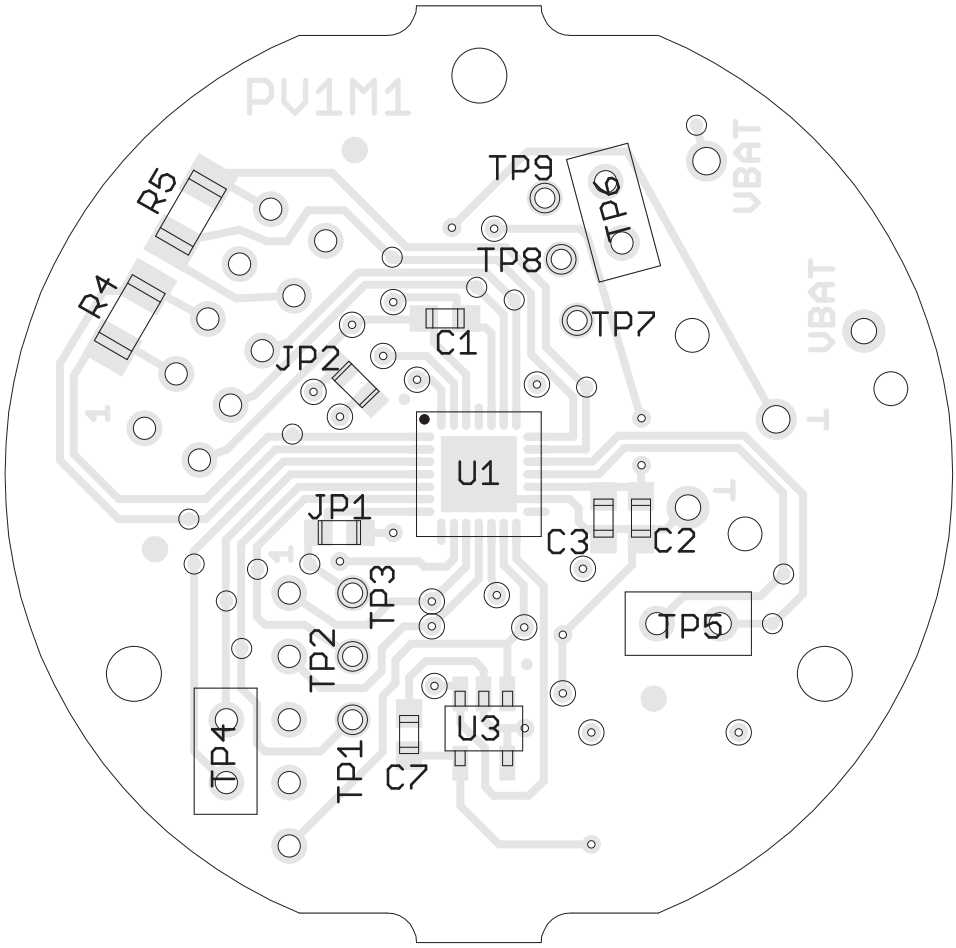

Figure 15: PV1M1 bottom side

ASSEMBLY PART LISTING: Bottom Side							
Device	**Type**	**Count**	**Value**	**Tol.**	**Comment**	**Assy Type**	**Package Outline**
C1, C2	C	2	10 µF	20%	X5R 10V	SMD	0603
C3, C7	C	2	100 nF	10%	X7R 10V	SMD	0603
U1	IC	1	iC-MHM			SMD	QFN28
U3	IC	1	24LC16B			SMD	SOT23-5
R4, R5	R	0	120 Ω		not assembled	SMD	0603
JP1[2]	R	0	250	1%	not assembled	SMD	0603
JP2[3]	R	0	0		not assembled	SMD	0603

Table 2: Part listing bottom side

[2] Using jumper JP1, the connection from iC-MHM pin P3, to iC-PV pin PRE can be made.
[3] JP2 can be closed in SPI mode. The SPI *Not Chip Select* (NCS) is then connected to junction 2 pin 10 (J2-10).

PHYSICAL DIMENSIONS

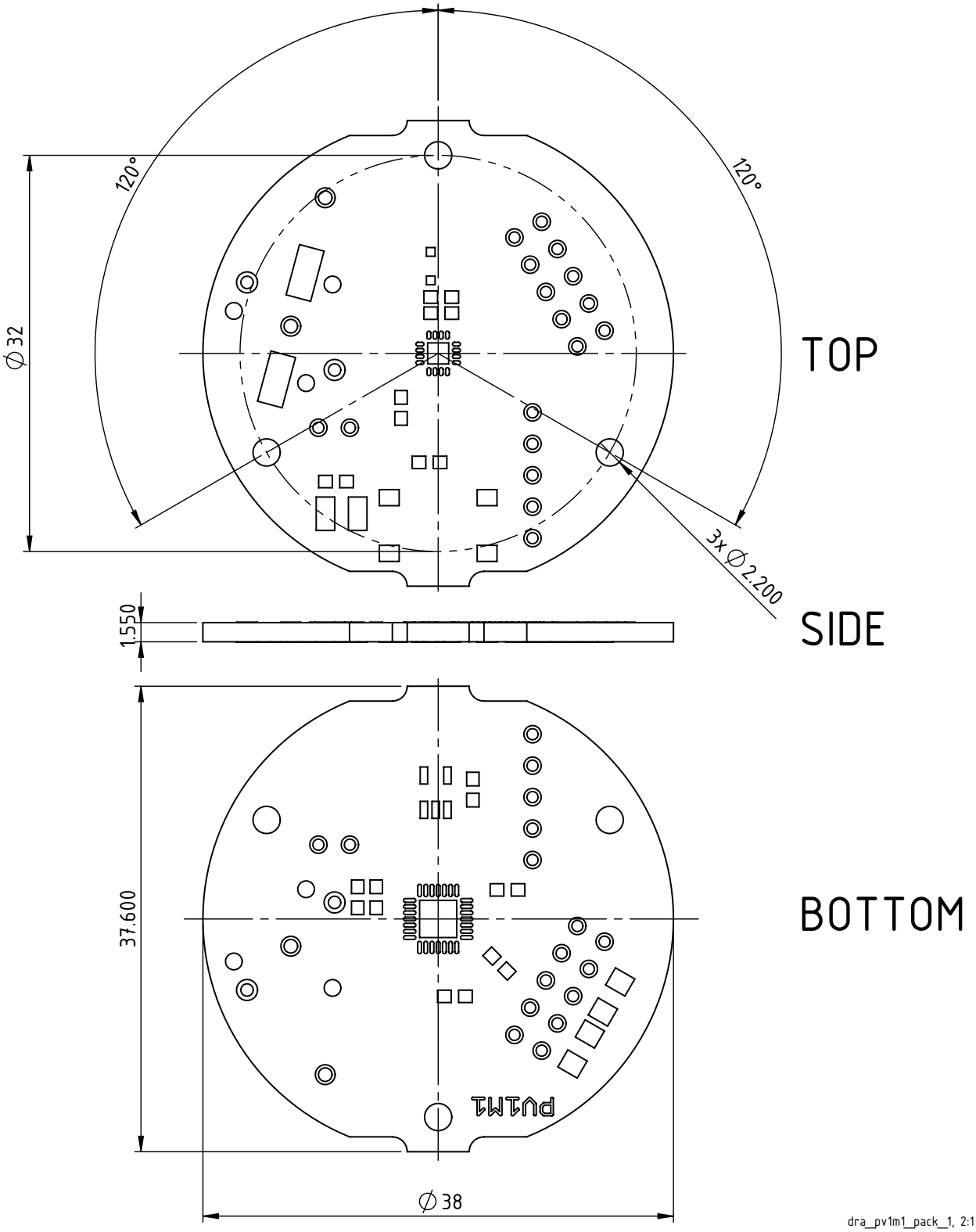

Figure 16: Physical dimensions (board PV1M1)

REVISION HISTORY

Rel.	Rel. Date*	Chapter	Modification	Page
A1	14-06-10	All	Initial release	All

Rel.	Rel. Date*	Chapter	Modification	Page
A2	14-06-11	BOARD PV1M1	J2 connector description	2
		ADAPTER CABLE AND CONNECTORS	PV1M1 connector description	3

Rel.	Rel. Date*	Chapter	Modification	Page
A3	14-09-05	PHYSICAL DIMENSIONS	Chapter introduced	7

Rel.	Rel. Date*	Chapter	Modification	Page
A4	15-01-14	ASSEMBLY PART LISTS	Figure 10 updated	5

Rel.	Rel. Date*	Chapter	Modification	Page
A5	15-12-01	BOARD PV1M1, ADAPTER CABLE AND CONNECTORS, APPLICATION EXAMPLE	Figure 1, 6 and 14 updated	1, 3, 8

Rel.	Rel. Date*	Chapter	Modification	Page
A6	2016-06-03	ORDERING INFORMATION	PC adapter iC-MB4 iCSY MB4U and iC-MB5 iCSY MB5U reworked	1
		OVERVIEW OF KIT ITEMS	Chapter reworked	2
		BiSS ADAPTER CABLE	Chapter reworked	4

* Release Date format: *YYYY-MM-DD*