MANUAL

MJK CHATTER HW MANUAL 1511

Chatter

Hardware Installation User Manual

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CE

Konformitetserklæring

Vi, MJK Automation ApS, DK-2850 Nærum, påtager os det fulde ansvar for at produktet

Declaration of Conformity

We, MJK Automation ApS, DK-2850 Naerum, declare under our sole responsibility that the product

Konformitätserklärung

Wir, MJK Automation ApS, DK-2850 Naerum, erklären in alleiniger Verantwortung, dass das Produkt

Chatter®

som denne erklæring angår, er i overensstemmelse med følgende standard(er) eller andre normdokument(er).

to which this declaration relates is in conformity with the following standard(s) or other normative document(s).

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EN 61000-6-4 2007-02-19 • EN 61000-6-2 2005-09-08

efter bestemmelserne i direktiv

following the provisions of Directive

Gemäss den Bestimmungen der Richtlinie

89/336/EEC, 2004/108/EC, 1999/EC

Declaration de conformite

Nous, MJK Automation ApS, DK-2850 Naerum, déclarons sous notre seule responsabilité que le produit

Dichiarazione di conformità

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al quale questa dichiarazione si riferisce, è conforme alla seguente normativa(e) standard o ad altri documenti di normativa(e)

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EN 61000-6-4 2007-02-19 • EN 61000-6-2 2005-09-08

conformément aux dispositions de Directive

conformemente alla disposizioni della Direzione

según las disposiciones de la(s) directiva(s)

89/336/EEC, 2004/108/EC, 1999/EC

28.08.2013

Jens Kruse

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Table of Contents

Chatter™ is a trademark of MJK Automation, Denmark.

1. Introduction

Thank you for choosing MJK Chatter™ Data Logger. We have done our best to design and produce a quality data logger to meet your requirements.

Chatter is easy to install, calibrate and set into operation. To ensure the best result MJK recommends that the user reads this manual to become familiar with all features, functions and details of the Chatter data logger.

Use and treat the equipment as instructed by the manufacturer, MJK Automation A/S, to ensure reliable operation and accurate measurements.

Chatter is available in two different versions: one for pipe mounting and one for wall mounting.

You can always get in touch with your supplier or with an MJK support hotline for advice and guidance:

- Tlf.: +45 45 56 06 56 E-mail: mjk@mjk.com

Visit our website **www.mjk.com** to read more about MJK Automation, our other products and the people behind.

MJK Automation is a Xylem brand.

2. Safety and Repair

Safety Instructions

- Read this manual thoroughly
- Be aware of the environment at the installation site. Be sure to use the necessary safety equipment and to comply with all applicable safety conditions and rules.
- **WARNING:** Improper or inadequate installation or use may lead to physical injury and/or damaged equipment !

Physical installation

DO NOT install the MJK Chatter data logger in areas with danger of explosion.

Repair

Repair through MJK or by MJK appointed repair firm only.

3. Specifications, Order Numbers and Accessories

Specifications

Specifications		
Digital inputs	4 pcs. 2 - 5 VDC (shortest interval 1x per count. 10 seconds)	
Analog inputs	4 pcs. 0.1 - 2.5 VDC	
Accuracy	Better than ± 1%	
Resolution	10 bit, input impedance min. 10 Kohm	
Data inputs	1 pc. RS-485 Modbus input for max. 4 units. Modbus RTU-mode, 9600 baud, 2-wire RS-485, master mode.	
Power supply for I/O	Built-in voltage regulated for sensors and other connected devices: 3.6 - 5 - 10 - 15 V DC (typically 100 mA @5 VDC)	
Interface connector	Internal USB 1.1, type mini B, female	
Antenna socket	MMCX, female	
Data transmission	GSM/GPRS quad-band 850/900/1800/1900 MHz supporting TCP/IP protocol. On-board SIM card holder, TCP/IP socket connection over GPRS and WWW Internet	
Memory/storage	30,000 measured values, time and date stamped	
Log intervals	10 seconds, 1 – 10 minutes, 1, 2, 4, 8, 12 or 24 hours	
Call intervals	10 minutes, 1, 2, 4, 8, 12 or 24 hours, 1 week	
Supply voltage	Built-in 3.6 VDC, 17 Ah lithium battery	
Battery life time	5 years @1 measurement per day and 1 call per day	
Installation	In pipes with an inner diameter of Ø63 to Ø106 mm or wall mounting	
Temperature range	- 20 … 60 °C	
Humidity	Max. 95% relative	
Clock	Real-time clock with 1-second resolution, day clock	
Encapsulation	IP 67	
Antenna	Wall mounting: External (accessory), 0 dBd, 900/1800 MHz	
Materials mounted in/ on:	Pipe: PC-ASA (top), aluminum (base)	Wall: Glass reinforced polycarbonate (PC)
Weigth	Pipe mounting: 1.8 kg	Wall mounting: 0.7 kg
Dimensions mounted in/on:	Pipe: Ø190 x Ø150 mm (inner diameter Ø63 - Ø106 mm)	Wall: 156 x 144 x 83 mm (w x h x d)
Standards and norms	EN 61000-6-2:2005, EN 61000-6-4:2007	

Table 1. Specifications

Order Numbers

Order Numbers	
204105	Chatter™ GSM / GPRS for pipe mounting
204106	Chatter™ GSM/GPRS/GPS for pipe mounting
204110	Chatter™ GSM / GPRS for wall mounting
204111	Chatter™ GSM/GPRS/GPS for wall mounting

Table 2. Order Numbers

Accessories

Accessories	
Antennas	See data sheet GB 6.3 GSM/GPRS Antennas
205116	Vandal proof, small and flat - 2 meter
205116-6M	Vandal proof, small and flat - 6 meter
205118	Vandal proof, small and flat - 15 meter
205116-XM	Vandal proof, small and flat - >15 meter
205175	Vandal proof, big and flat - 2 meter
205176	Vandal proof, big and flat - 6 meter
205177	Vandal proof, big and flat - 10 meter
205178	Vandal proof, big and flat - 15 meter
205119	Antenna for mast - 6 meter
205114	Antenna for mast - 10 meter
205185	Antenna for wall, fin - 2 meter
205186	Antenna for wall, fin - 6 meter
205187	Antenna for wall, fin - 10 meter
205188	Antenne for wall, fin - 15 meter
Transmitters	See data sheet GB 2.76 Digital Pressure Transmitters
521751	Wedge set, metal, 3 x 3 pcs., wedge sizes: 1, 2, 3 og 4
521752	Wedge set, metal, 3 x 3 pcs., wedge sizes: 4, 5 og 6
521755	Wedge screws, set of 3 pcs.
521756	Threaded inserts for plastic wedges
521760	Gasket for Chatter™ base/pipe
521761	Gasket for Chatter™ top/base
521762	Gasket for Chatter™ panel
550246	Battery 3.6 V, 17 Ah
569108	Screw, self-tapping, KB50x14
569123	Screw, self-tapping, KB35x7
571055	Rubber band, 60mm, compound

Table 3. Accessories

4. Electrical Connections

Access the electrical connection terminals of the Chatter unit, the SIM card and the battery as follows:

1. Open and remove the padlock that prevents unauthorized access to the Chatter unit.
2. Turn the green top approx. 1 cm counterclockwise and lift it off.

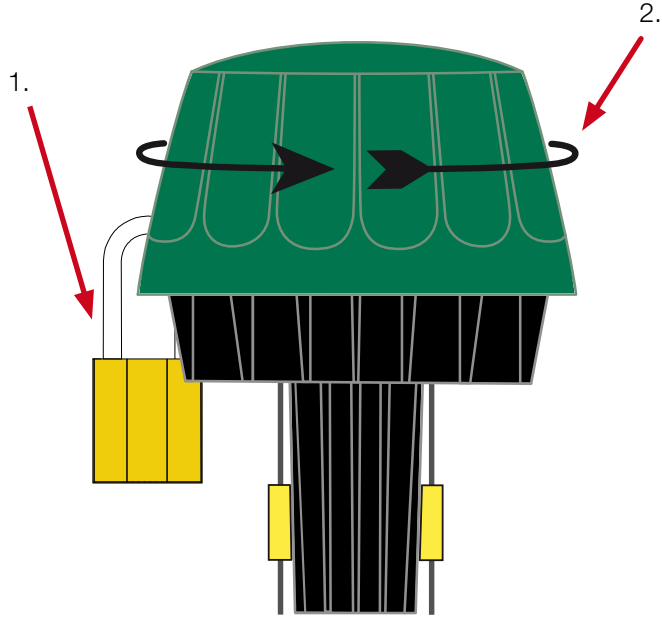

Figure 1. Opening the Chatter Unit for Pipe Mounting

3. Remove the seven TORX screws at the bottom of the green top to access to terminal blocks for digital and analog inputs, voltage outputs and serial data communication (see figure 2 overleaf).

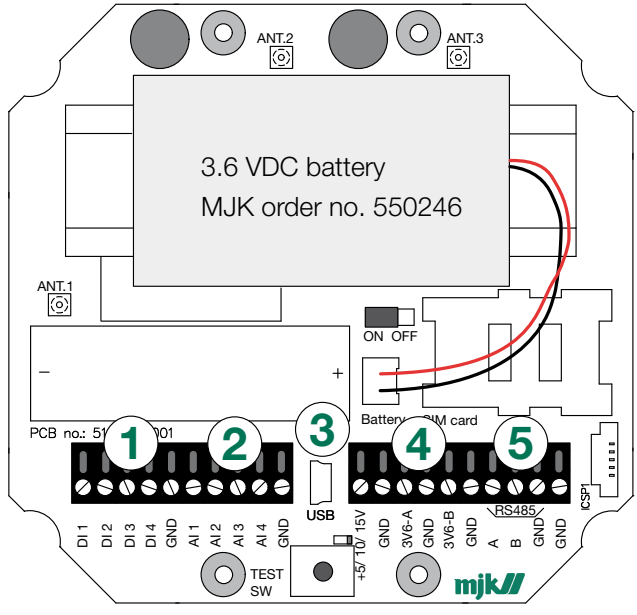

Figure 2. Terminal Blocks for Signal Inputs, Voltage Outputs and Serial Communication

Digital Inputs (1)

Chatter has four digital inputs each with four functions during normal operation:

NC (passive) The input is normally connected to GND and will be activated, when the connection is broken.

NO (passive) The input is normally open and will be activated, when it is connected to GND.

NC (active) The input is normally connected to a voltage between 2 - 5V and will be activated, when the connection is broken.

NO (active) The input is normally open and will be activated, when it is connected to a voltage betweeen 2 - 5V.

Digital Inputs	
Terminal	Designation/function
DI 1	NC/NO, active/passive
DI 2	NC/NO, active/passive
DI 3	NC/NO, active/passive
DI 4	NC/NO, active/passive
GND	Common GND terminal for DI 1 - 4

Table 4. Digital Inputs

Analog Inputs (2)

Chatter has four analog inputs each with a range of 0,1 - 2,5 VDC (see position “2” on the drawing to the left).

Analog inputs	
Terminal	Designation/function
AI 1	0.1 - 2.5 VDC
AI 2	0.1 - 2.5 VDC
AI 3	0.1 - 2.5 VDC
AI 4	0.1 - 2.5 VDC
GND	Common GND terminal for AI 1 - 4

Table 5. Analog Inputs

USB Connector (3)

Chatter is equipped with a USB socket for communication with for example a laptop computer for configuration.

Voltage Outputs (4)

Chatter has three voltage outputs for MJK-approved equipment: one from the factory programmable 5/10/15 VDC supply and two separate 3.6 VDC outputs.

Voltage Outputs	
Terminal	Designation/function
+5/ 10/ 15 VDC	Programmable, ON/OFF-controlled voltage supply (+5 VDC from factory)
GND	Ground
3V6-A	3.6 volt (always ON)
GND	Ground
3V6-B	3.6 volt (ON/OFF-controlled by the electronics during measurement)
GND	Ground

Table 6. Voltage Outputs for MJK-approved Equipment

The outputs ”5/10/15” and ”3V6-B” are controlled in such a way that they are activated during measurement. ”3V6-A” is connected directly to the battery and is as such always active.

Serial Data Communication for Modbus (5)

Chatter is equipped with RS-485 serial data communications. See position "5" in Figure 2.

RS-485 Serial Data Communication for Modbus	
Terminal	Designation/function
A (RS485)	Signal A
B (RS485)	Signal B
GND (RS485)	Ground
GND	Ground

Table 7. RS-485 Serial Data Communication

Other Main Components on the Circuit Board

Battery (6)

The battery is located on top of the Chatter PCB (see Figure 3). Connection is through a connector placed in the middle of the circuit board ("Battery", red and black wires).
Please note that the battery can be replaced without first setting the Chatter unit in "OFF" position.
See section **6. Gain Access to SIM Card and Battery** and section **7. Internal Installation in the Chatter Unit** for gaining access to and changing the battery.

Jumper (7)

A jumper is placed right below the battery with two positions: ON and OFF. In ON position the Chatter incl. pressure transmitter is powered (activated), and in OFF position it is disconnected (switched off).

Booster Capacitor (8)

The booster capacitor delivers current during data transmissions.

SIM Card (9)

The SIM card facilitate communication via the GSM/GPRS network.
See also the procedure for inserting/changing the SIM card in section **7. Internal Installation in the Chatter Unit** on page **25**.

Antenna Connector ANT.1 (10)

Connector no. 1 is designated for a standard GSM/GPRS antenna.

Antenna Connector ANT.2 (11)

Connector no. 2 is designated for an alternative GSM/GPRS antenna with an alternative modem installation.

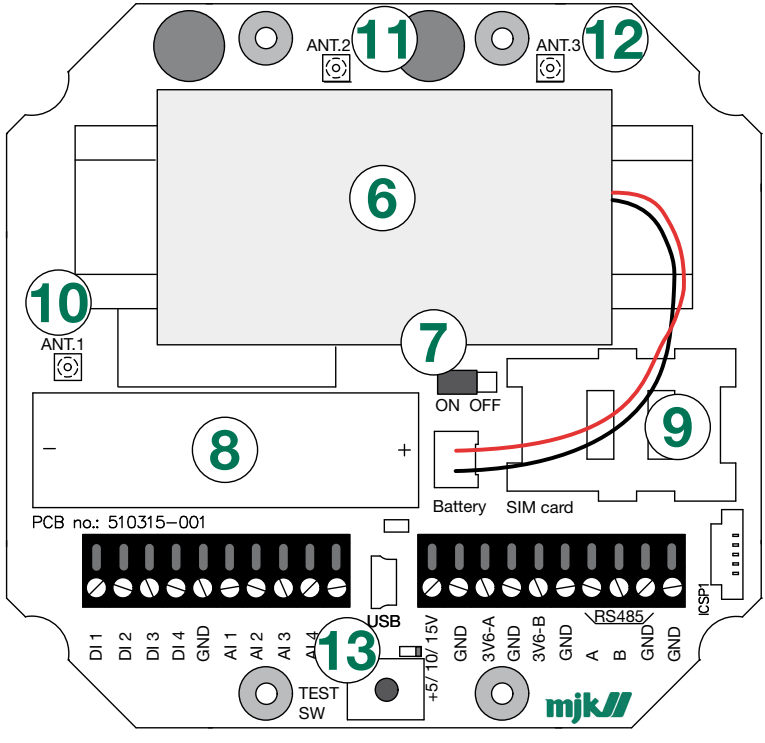

Figure 3. Other Main Components on the Circuit Board

Antenna Connector ANT.3 (12)

Antenna connector no. 3 is designated for a GPS antenna in units with a GPS module mounted.

TEST SW (13)

The Test switch may be used by service personnel to ”wake” the Chatter.

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5. Mounting

MJK Chatter data logger is supplied in two different mounting versions: one for pipe mounting and one for wall mounting (mounting on wall or cabinet).

5.1 Pipe Mounting

Necessary tools and parts:

- Wedge set to fit pipe diameter
- Socket spanner, 7 mm

1. Activate the Chatter unit(s) as described in section **9. Physical Activation** on page **31**.
2. Re-assemble the Chatter unit(s) as described in section **6.2 Wall Mounting** on page **23**.
3. Prepare the Chatter base with wedges to fit the pipe diameter:

Wedge	From inner diameter ---->	to inner diameter
Wedge 1	Ø63 mm	Ø71 mm
Wedge 2	Ø70 mm	Ø78 mm
Wedge 3	Ø77 mm	Ø85 mm
Wedge 4	Ø84 mm	Ø92 mm
Wedge 5	Ø91 mm	Ø99 mm
Wedge 6	Ø98 mm	Ø106 mm

Table 8. Wedge Sizes

4. Secure stud bolts and wedges with a rubber band as shown below.

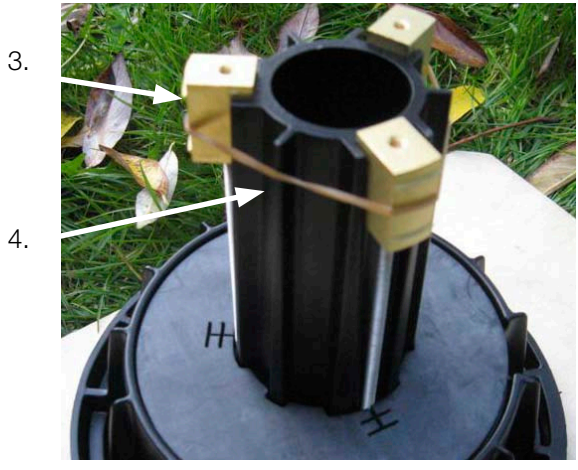

Figure 4. Secure Stud Bolts and Wedges with a Rubber Band

5. Immerse the Chatter base in the pipe (if possible with the padlock pointing away from public view), and then pull the screws up until the wedges buckle in the pipe. Thereby the base is centered in the pipe, and the wedges will automatically level.

Figure 5. Center the Base

6. Screw the screws into the base, one by one without using any tool:

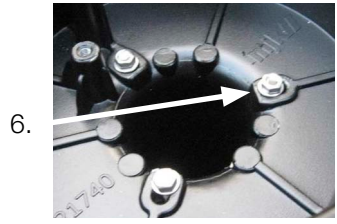

Figure 6. Screw by Hand

7. Tighten the screws with a 7 mm spanner until the base is bolted onto the pipe:

Figure 7. Tighten the Screws with a Spanner

From here on the base **may not** be moved, rotated or lifted!

8. Fasten the security wire of the pressure transmitter into the base before the pressure transmitter is placed inside the pipe.
IMPORTANT: Use a large washer between the wire and the screw, so that the wire can not escape the base!

Figure 8. Fasten the Security Wire

9. Remove the protective sleeving from the pressure transmitter and immerse the pressure transmitter in the pipe.

9.

Figure 9. Immerse the Pressure Transmitter

10. Connect the pressure transmitter cable to the green Chatter top. ***IMPORTANT: The guide pins must align to ensure correct connection.***

10.

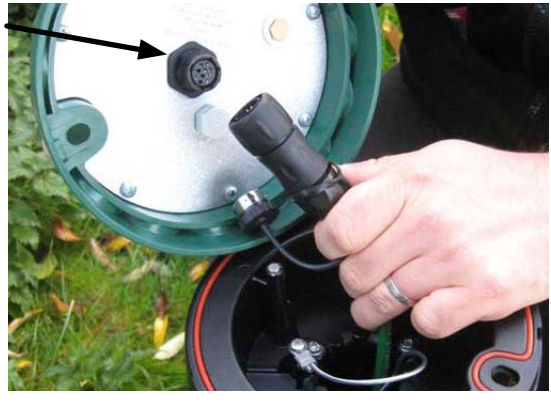

Figure 10. Connect the Pressure Transmitter Cable

11. Mount the Chatter top on the base by turning the top approx. 1 cm counter-clockwise, until the holes for the security padlock align.
    Expect a slight drag over the last few millimeters. This is due to the activation of the intruder alarm (a magnetic switch between top and base).
12. Mount the padlock (see figure below).

Figure 11. Mount the Padlock

13. Make sure that the green Chatter top is mounted and secured correctly:

Right

WRONG!

Figure 12. Top Mounted and Secured Right and Wrong

5.2 Wall Mounting

1. Mount the cabinet on the wall.
2. Connect the pressure transmitter(s) according to the example in section **8.1 MJK Chatter and MJK Expert Transmitter** on page **29**.
3. Connect the relevant in- and outputs.
4. Aktivate the Chatter unit(s) as described in section **9. Physical Activation** on page **31**.
5. Close the Chatter unit(s) as described in section **6.2 Wall Mounting** on page **23**.

6. Gain Access to SIM Card and Battery

To change SIM card or battery in a Chatter unit, you must gain access to the unit's circuit board.

6.1 Pipe Mounting

1. Open and remove the padlock that prevents unauthorized access to the Chatter unit.
2. Turn the green top approx. 1 cm counterclockwise (but do not lift it off!)
3. Leave the top on for about two minutes and then lift it off.
   This is to ensure a valid measurement and to allow time for sending an alarm to the server.
4. Remove the pressure transmitter connector by turning the union counter-clockwise.
5. Dismount the cover plate by removing the seven screws that secures it:

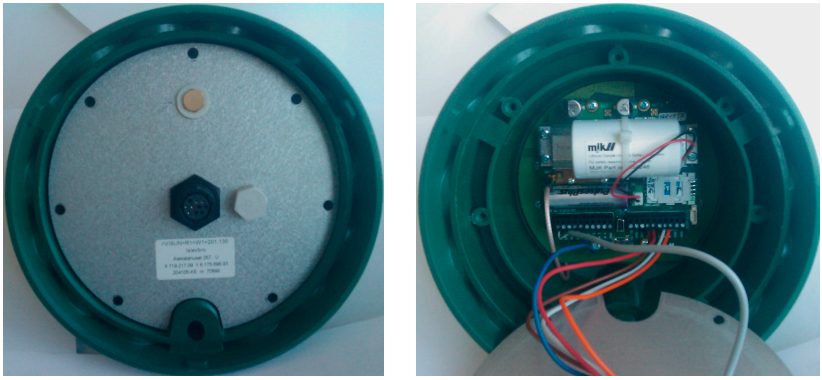

Figure 13. Pipe Mounted Chatter Unit

6. Insert SIM card or change battery as described in section **7. Internal Installation in the Chatter Unit** on page **25.**
7. Re-assemble the Chatter unit.
   IMPORTANT: Make sure that the leads do not get stuck or become squeezed between the top, the rubber gasket and the cover plate.
8. Tighten the screws and make sure that the cover plate fits closely to the rubbber gasket.

9. Re-connect the pressure transmitter connector by turning the union clockwise.
10. Immerse the pressure transmitter into the pipe, and make sure that the cable and the security wire hang freely inside the pipe to ensure reliable measurements.
11. Mount the Chatter top at the base by turning the top approx. 1 cm counter-clockwise, until the holes for the security padlock align.
    Expect a slight drag over the last few millimeters. This is due to the activation of the intruder alarm (a magnetic switch between top and base).

Right

WRONG!

Figure 14. Chatter Top Mounted Right and Wrong

12. Re-mount the padlock.

6.2 Wall Mounting

1. Locate the Chatter unit:

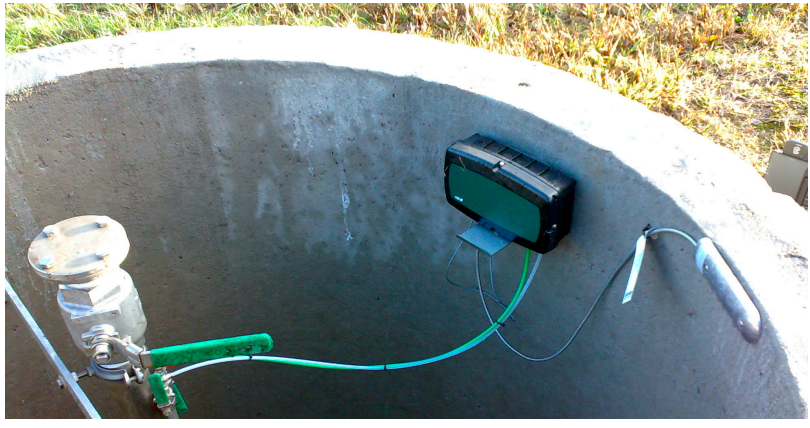

Figure 15. Wall Mounted Chatter in Custom-designed Cabinet

2. Loosen the four screws in the top cover to open the Chatter unit:

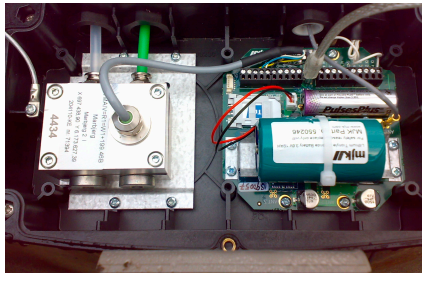

Figure 16. Access to SIM Card - Wall Mounting

3. Insert SIM card or change battery as described in section **7. Internal Installation in the Chatter Unit** on page **25.**
4. Re-assemble the Chatter unit.
   IMPORTANT: Make sure that the leads do not get stuck or become squeezed between the cabinet and the cover.
5. Tighten the four screws in the cover.
6. Re-mount the Chatter unit in its original location.

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7. Internal Installation in the Chatter Unit

7.1 Inserting a SIM Card

1. Open the Chatter unit to gain accesss to the circuit board and the SIM card holder as described in section **6. Gain Access to SIM Card and Battery** on page **21**.
2. Open the SIM card holder by applying light pressure on the upper part (the lid) and at the same time dragging it towards the edge of the circuit board (here: to the right as indicated by the arrow):

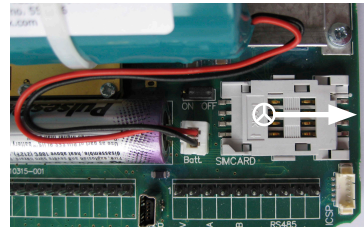

Figure 17. SIM Card Holder - Empty and Locked

The lid opens to an angle of approx. 45 degrees and allows easy access for SIM card insertion:

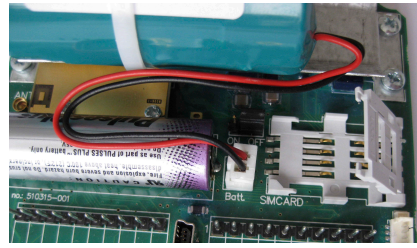

Figure 18. SIM Card Holder - Empty and Open

Ensure the SIM card is cleansed from eventual fingerprints, or any dirt or grease, as even the smallest amounts can influence the functionality of the SIM card.

Note: Corrosion and verdigris can occure, due to the environment where Chatter is installed, this can cause fall-out of communication. in case of this, try and clean the contacts and card, then re-inster the card and re-try communication.

3. Carefully insert the SIM card into the grooves that hold the card, and finally push it to the end stop.
   ***IMPORTANT: The SIM card must align with the grooves all the way down. Likewise the SIM card's right, cut-off corner must point upwards and to the left (see arrow)**:*

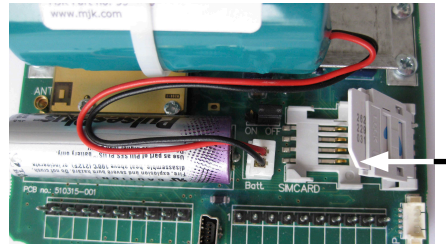

Figure 19. SIM Card Correctly Inserted into the Grooves

4. Secure the SIM card in the holder by applying light pressure on the upper part (the lid) and at the same time dragging it towards the middle of the circuit board (here: to the left as indicated by the arrow).

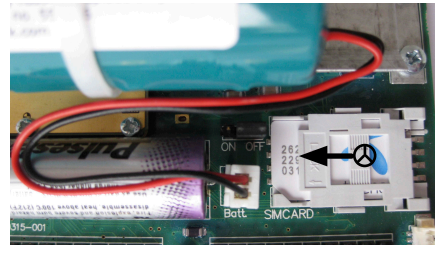

Figure 20. SIM Card Secured in the Card Holder

5. If there is a PIN code on the SIM card, the code must be added to the Chatter configuration during setup.
   This can be achieved with the MJK utilities for local configuration: "Chatter Setup Tool".
6. You can also use "Chatter Setup Tool" to change to another APN, or to change other parameters related to the call settings.
7. Re-assemble and lock the Chatter unit as described in section **6. Gain Access to SIM Card and Battery** on page **21**.

7.2 Battery Change

1. Open the Chatter unit to gain accesss to the circuit board and the battery as described in section **6. Gain Access to SIM Card and Battery** on page **21**.
2. Carefully push the battery sidewards to free it from the cable strap that holds the battery.
   Alternatively you can cut the cable strap (this requires, however, that you use a new strap for the new battery).
3. Disconnect the battery leads (red and black) from the Chatter circuit board by pulling out the “Batt” plug.
4. Connect the new battery’s leads to the “Batt” connector.
5. Push the new battery into the old cable strap (or, if cut, secure the new battery with a new cable strap).
6. Re-assemble og lock the Chatter unit as described in section **6. Gain Access to SIM Card and Battery** on page **21**.

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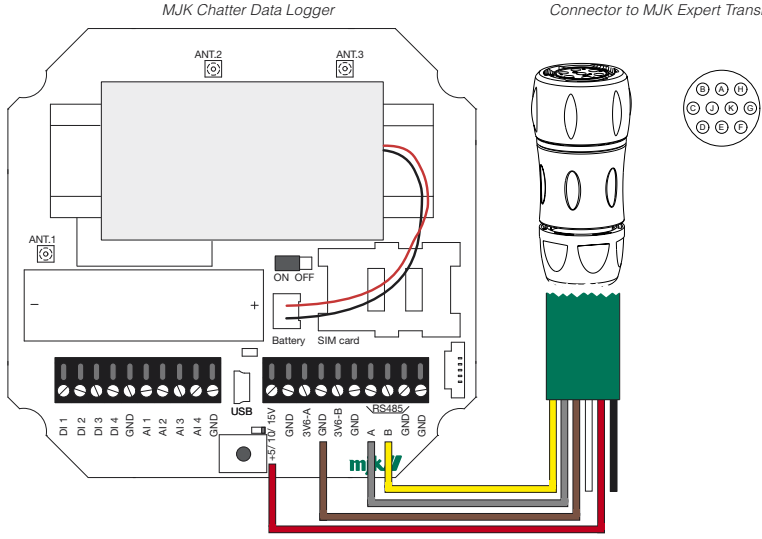
8. Connection Examples

8.1 MJK Chatter and MJK Expert Transmitter



Color	Pin	Signal
Yellow	D	RS 485 B
Grey	E	RS 485 A
Brown	K	GND (ground)
White	B	n/c (signal 0,1-2,5 / 0,3-3,0 V DC)
Red	G	+5/10/15V (3,5 -12 V DC)
Black	F	n/c (shield)

Figure 21. Connection Example 1 - MJK Expert Transmitter

IMPORTANT: If several pressure transmitters are to be installed, they must:

1) be ordered with customized factory setup for the specific purpose

2) be connected in parallel

8.2 MJK Chatter and Digital Input

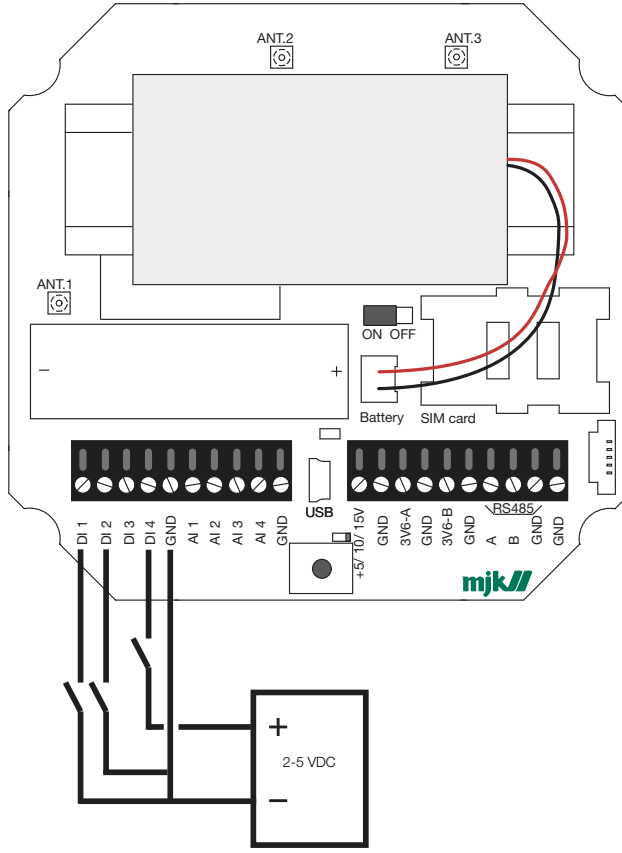


Figure 22. Connection Example 2 - Digital Input

In this example DI1 and DI2 are connected ”passive”, and DI4 is connected ”active”.

9. Physical Activation

The Chatter unit is activated physically by moving the jumper shown on page 12 and in the figures below from position ”OFF” to position ”ON”.

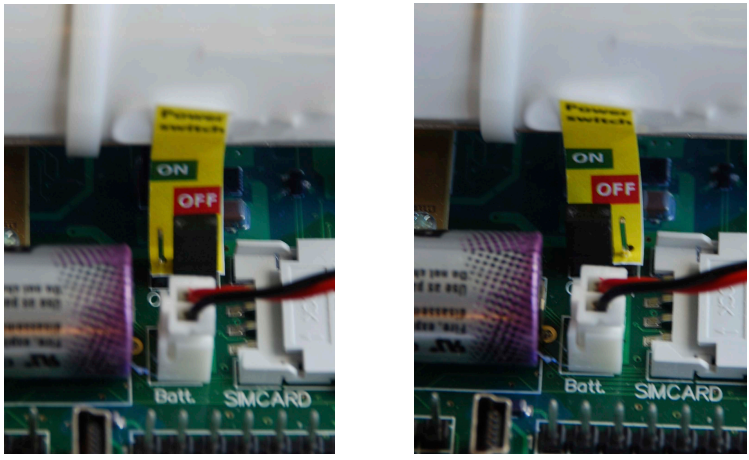


Figure 23. On-Off Jumper from ”OFF” to ”ON” position

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10. Mechanic Dimensions

Chatter Unit for Pipe Mounting

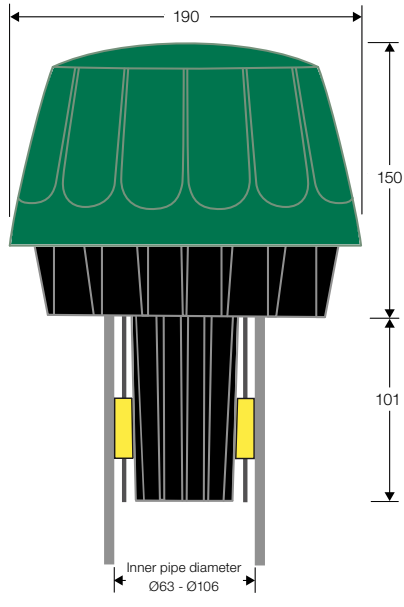

Figure 24. Mechanic Dimensions - Pipe Mounted

Chatter Unit for Wall Mounting

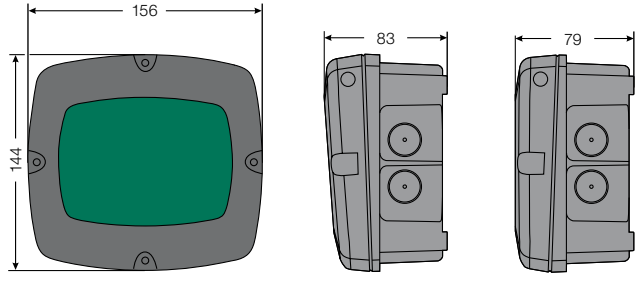

Figure 25. Mechanic Dimensions - Wall Mounted

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11. Maintenance

The MJK Chatter Data Logger requires no maintenance.

Service Agreement

A service agreement guaranties the equipment's long term reliability and accuracy. Contact one of MJK's national sales- or service representatives to make a service agreement with regular service visits.

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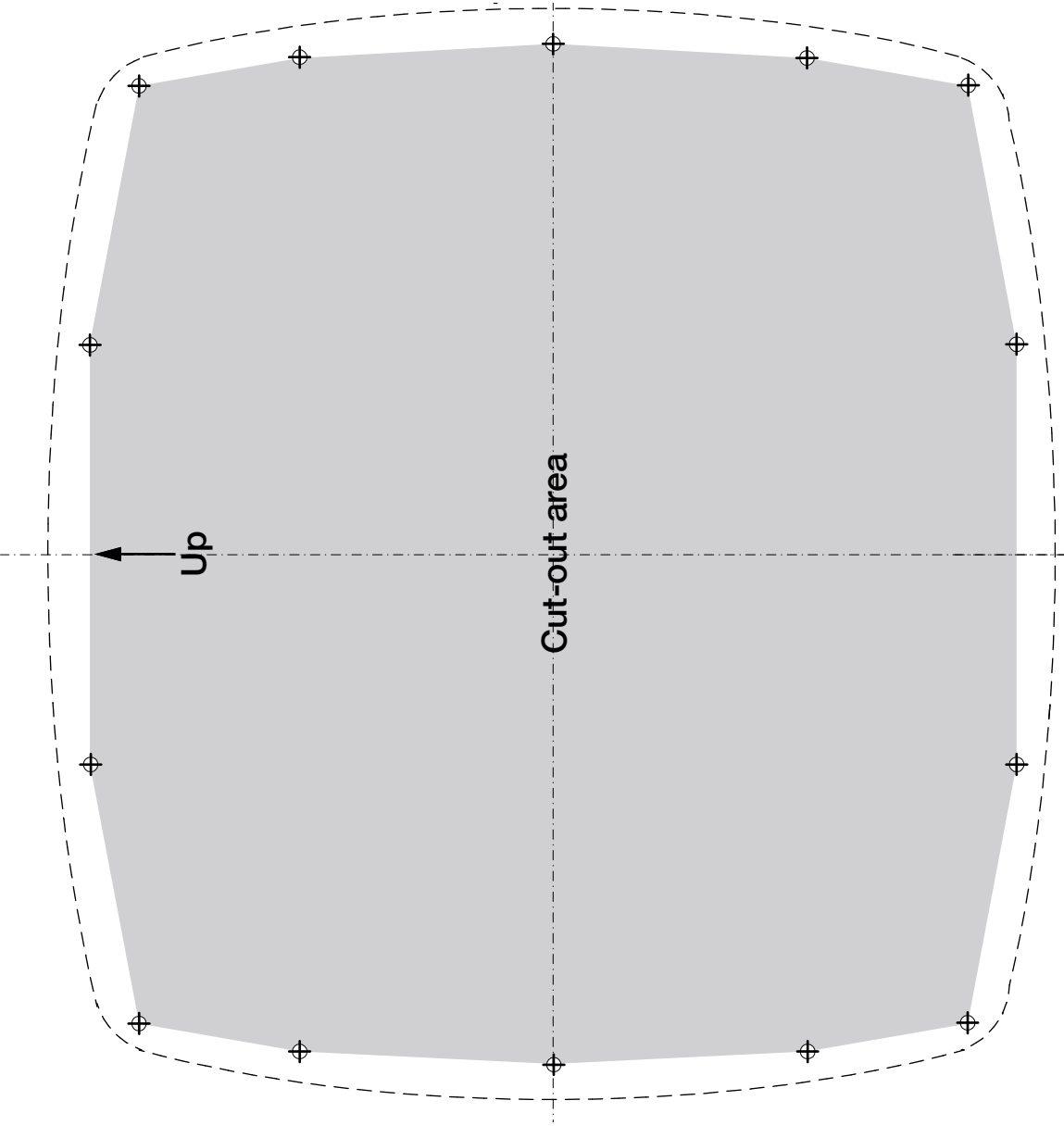
Appendix A. Frontpanel Cut-Out Template

The dotted lines indicate the front panel contour and measures 155 x 145 mm.



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Appendix B. Calculation of Battery Lifetime

The battery in the MJK Chatter unit is of the lithium-trionyl-ion-trotyl type which is characterized by a high energy density, a low self-discharge, and a long lifetime. The energy density is 17 Ah nominal and guarantied 15 Ah (15.000 mAh). Depending on the use of the Chatter unit you can estimate the battery lifetime.

The Chatter will, depending on the setup, execute one control call every 25th. hour (if a shorter interval has not been selected). This ensures that you can always make changes to the setup efter 25 hours. MJK recommends that you perform a call every 24 hours (once a day) or more frequent.

The lifetime calculation is simple for usages with a fixed log interval, whereas usages with event log require a time estimation for the event logs.

Calculation Template

Chatter basic consumption per day (fixed) =				1.0
No. of logs per day @sensor consump.=2mA	?	x	0.1 =	-
No. of logs per day @sensor consump. =4mA	?	x	0.2 =	-
No. of event logs per day @sensor consump.=2mA	?	x	0.1 =	-
No. of event logs per day @sensor consump. =4mA	?	x	0.2 =	-
No. of calls per day	?	x	3 =	-
No. of alarm calls per day	?	x	3 =	-
Consumption per day (total):				-

Battery lifetime in days:	15000/consump. per day [day] =	-
Battery lifetime in months:	Battery lifetime [days]/30 [months] =	-
Battery lifetime in years:	Battery lifetime [months]/12 [years] =	-

Calculation Example 1

Chatter basic consumption per day (fixed) =				1.0
No. of logs per day @sensor consump.=2mA	1	x	0.1 =	0.1
No. of logs per day @sensor consump. =4mA	-	x	0.2 =	-
No. of event logs per day @sensor consump.=2mA	-	x	0.1 =	-
No. of event logs per day @sensor consump. =4mA	-	x	0.2 =	-
No. of calls per day	1	x	3 =	3.0
No. of alarm calls per day	0.01	x	3 =	0.03
Consumption per day (total):				4.13

Battery lifetime in days:	15000/consump. per day [day] =	3632.1
Battery lifetime in months:	Battery lifetime [days]/30 [months] =	121.1
Battery lifetime in years:	Battery lifetime [months]/12 [years] =	10.0 yrs

Calculation Example 2

Chatter basic consumption per day (fixed) =				1.0
No. of logs per day @sensor consump.=2mA	24	x	0.1 =	2.4
No. of logs per day @sensor consump. =4mA	-	x	0.2 =	-
No. of event logs per day @sensor consump.=2mA	60	x	0.1 =	6.0
No. of event logs per day @sensor consump. =4mA	-	x	0.2 =	-
No. of calls per day	-	x	3 =	-
No. of alarm calls per day	-	x	3 =	-
Consumption per day (total):				9.4

Battery lifetime in days:	15000/consump. per day [day] =	1595.7
Battery lifetime in months:	Battery lifetime [days]/30 [months] =	53.2
Battery lifetime in years:	Battery lifetime [months]/12 [years] =	4.4 yrs

Calculation Example 3

Chatter basic consumption per day (fixed) =					1.0
No. of logs per day @sensor consump.=2mA	24	x	0.1	=	2.4
No. of logs per day @sensor consump. =4mA	-	x	0.2	=	-
No. of event logs per day @sensor consump.=2mA	180	x	0.1	=	18.0
No. of event logs per day @sensor consump. =4mA	-	x	0.2	=	-
No. of calls per day	2	x	3	=	6.0
No. of alarm calls per day	-	x	3	=	-
Consumption per day (total):					27.4

Battery lifetime in days:	15000/consump. per day [day] =	547.0
Battery lifetime in months:	Battery lifetime [days]/30 [months] =	18.2
Battery lifetime in years:	Battery lifetime [months]/12 [years] =	1.5 yrs

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Appendix C. Calculation of WLD- and Ref. Datum

The following examples illustrate how you can calculate the water level datum (WLD) in relation to the cable length and the reference datum of a bore.

Example: A bore has the following characteristics:

- Reference datum: 34.76 m (the level at which the Chatter base rests on the pipe/bore head)
- Cable length: 25.0 m
- Sensor depth: 24.9 m (cable length - 10 cm)
- Measurement from DB: 7.65 m

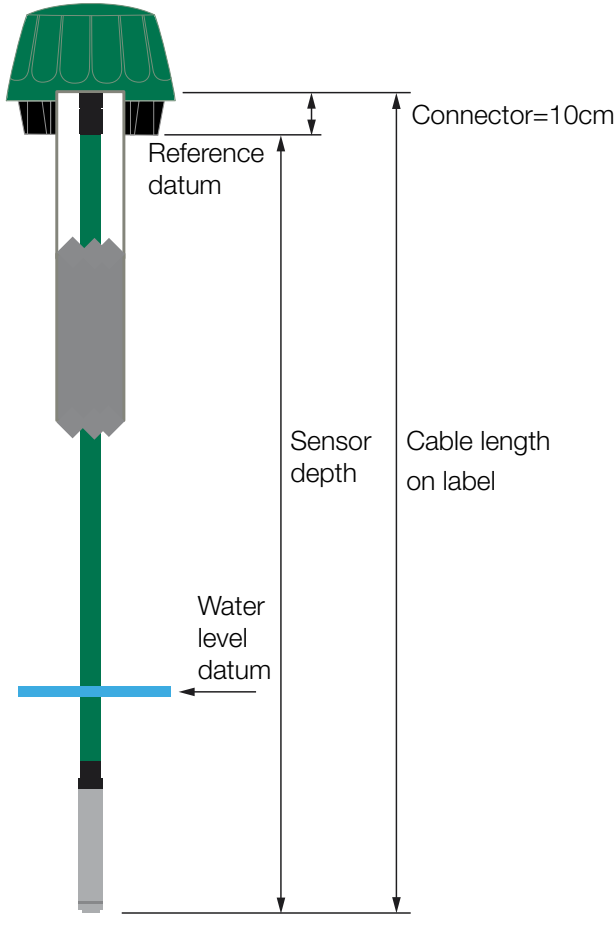

Figure 26. Lengths and Datum

The water level datum (WLD) in this example: 34.76 - 24.9 + 7.65 => 17.51 m

The following figures/numbers for the bore are required as entries to the data base to achieve a valid calculation of the water level datum.

Sensor depth from top of bore

1. Sensor depth from the top of the bore = total cable length – 10cm.
2. “Total cable length” is printed on a label near the cable connector (example: cable length = 11.86 m).
3. To get the sensor depth in relation to the top of the bore, you must subtract 10 cm due to the cable connector length (11.86 - 0.1 = 11.76 m).
4. This is also the sensor depth that you use in calculations and write into the Chatter database (written to the server from the Chatter Link ”Modbus” tab in the field ”Sensor depth”).

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Liability

MJK Automation are liable to the common rules of Danish law on product liability, however, the liability is reduced to coverage of our public liability insurance of products. To the extent where nothing else follows in lines of invariable rules of law, we are not liable for loss of profits and working deficits or other indirect losses.

Changes

As our products are developed continuously, we reserve the right to make any alterations without prior notice.