OriLink®
Monitoring System

Multi Point Dispense Module, 23400

(Covers MPDM with PCB version 203 02 62 C and D, some features may be missing in earlier versions)

Table of Contents

1. Introduction

The MPDM, (**M**ulti **P**oint **D**ispense **M**odule), is the engine in an OriLink® monitoring system. It measures the dispensed volume and opens / closes the solenoid valve. A KP, (KeyPad), connected to a MPDM gives the smallest and simplest OriLink® monitoring system. Each MPDM connected to an OriLink® monitoring system four more dispense points.

> **NOTE! The Orilink® installation manual should be available when installing and configuring a MPDM.**

2. Mechanical installation

The MPDM is delivered mounted in a metal box with power supply. It can also be delivered as a PCB with mounting kit.

Complete MPDM in a box is mounted on a wall or other suitable place using the four-ø5 mm holes in the bottom corners of the box.

If a PCB is used it is important that a power supply with enough performance is used.

3. Electric installation

When installing the MPDM (23400) there are different areas of connection.

> **Note! Before connecting the module or maintenance, make sure that the mains power is shut down.**

3.1. Mains, 230VAC side

The MPDM should be connected to mains 230VAC/50Hz using phase, common and ground.

Alentec & Orion AB recommend that the connection is done through a 2-pole lockable working switch.

The "knock-out" holes on the lower right hand (see picture) should only be used for mains power supply to separate it from the control (DC) side of the module.
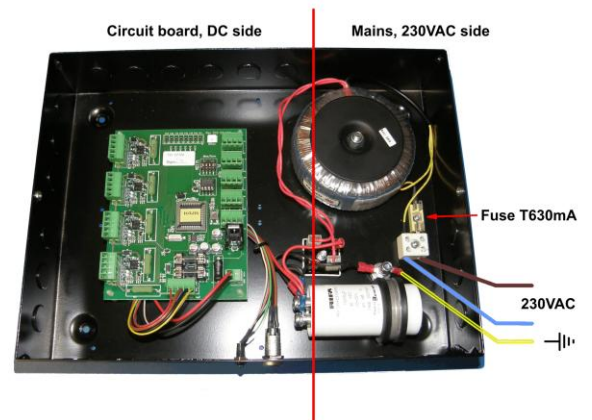
3.2. Circuit board, DC side

There are four versions of the MPDM PCB (part number 203 02 62) A, B, C and D. This manual generally describes all four versions but is focused on versions C and D. The main difference between version C and D is that version D is more optimised to enable surface mounting of components which has made it possible to place indicator LED's closer to the indicated thing and add the possibility of an optional digital I/O-connector.
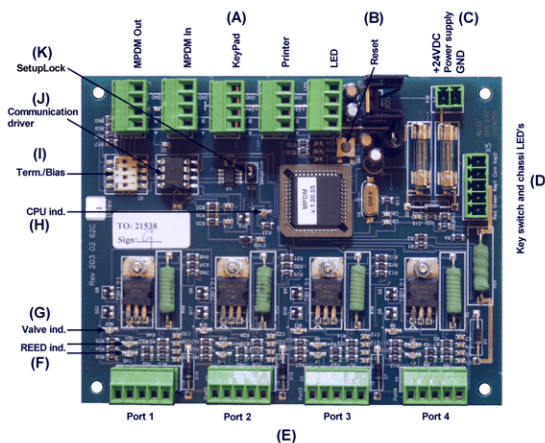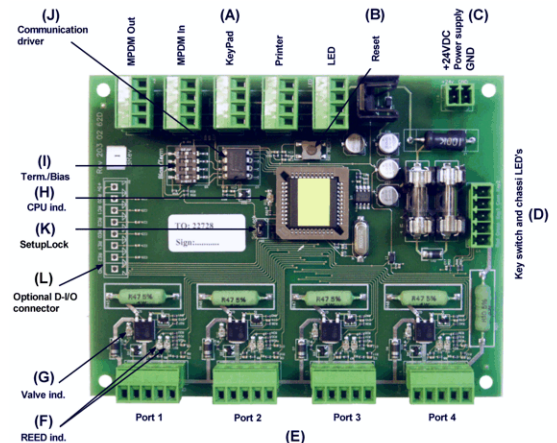
203 02 62C   203 02 62 D

3.2.1.　Miscellaneous connections

24 VDC is connected to the connector **(C)**. In a MPDM (23400) this is already connected.

NOTE!　If the connector (C) has been removed and should be reconnected, check polarity! The poles are labelled on the circuit board. Red cable is +24VDC and Black is GND.

The chassis-mounted key switch and indication diodes are connected connector **(D)**.

With the key switch you can set the status of the module to NORMAL- (GREEN light), OFF- (NO light) or OVERRIDE- (RED light) mode.

In a MPDM (23400) this is already connected.
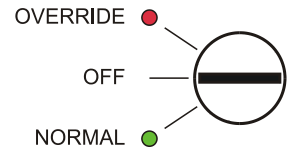
3.2.2.　Communication

It has five connectors **(A)** for the OriLink® communication. Two of these connectors, **MPDM IN** and **MPDM OUT** are not connected to **+24V** and are intended for a connection to other MPDM's or other modules that already have +24VDC. This is to prevent interconnecting of +24VDC from two power supplies.

The other three connectors are used to connect external devices without a power source such as a Printer Module (PM), a LED Module (LED) and/or a KeyPad (KP). These connectors can only supply power to a single device. For more detailed information see the **OriLink® Manual**

NOTE!　If the communication loop begin in one of these modules it must be connected to either MPDM IN or MPDM OUT or +24V must not be connected.

NOTE!　Communication cables should only be connected through "knock-out" holes to the left side ("cirquit board side") of the module to prevent mixing of mains 230VAC and 24VDC cables.

3.2.3.　Meters and solenoid valves

The four connectors **(E)** market **+24 V, OC, A, B** and **GND** are used for dispense points. Solenoid valves and meters are connected to these.
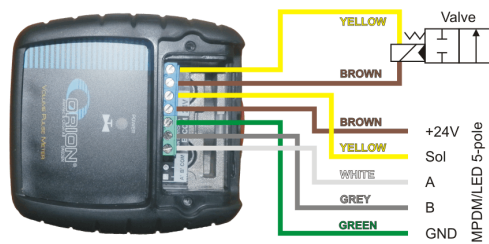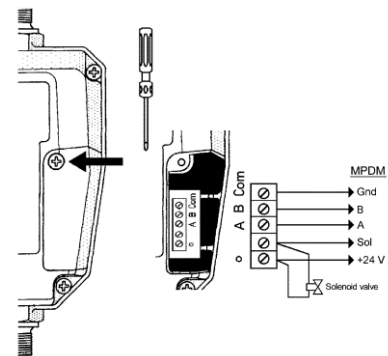
24736 and similar　　　　　　　　24738 and similar

A on the MPDM port is connects to A on the meter.

B on the MPDM port connects to B on the meter if it is equipped with two REED switches and both of them should be used.

GND on the MPDM port connects to Com on the meter.

+24 V on the MPDM connects to o on the meter.
Sol on the MPDM connects to the unmarked hub on the meter.
The solenoid valve connects between o and the unmarked hub on the meter.

The meter 24728/24736 is equipped with a valve symbol to indicate open dispense point.

TIP! **If the Alentec & Orion AB stock cable, (part. Nr. 23 393), is used the colours should match the following:**

BROWN	to	+24V	
YELLOW	to	Sol	
WHITE	to	A	
GREY	to	B	A meter that has 2 pulse train outputs and cable 23412 (Optional)
GREEN	to	GND	

This will make service and support much faster

NOTE! **Meter and solenoid valve cables should only be connected through "knock-out" holes to the left side ("cirquit board side") of the module to prevent mixing of mains 230VAC and 24VDC cables.**

3.2.4. Optional connector

To simplify the use of the optional digital (5VDC) I/O connector a Phoenix MCV 1,5/8-G-3,81 (or equal) can be soldered to the PCB. Then a Phoenix MC 1,5/8-ST-3,81 connector can be used for connecting things.

To control more power than just 5VDC TTL a solid state TTL to power relay can be used. Our part number 339 00 68 is a 5-pole 5VDC TLL to 10 - 36VDC 5A relay.

3.2.5. Other hardware features

The RESET-button **(B)** can be used to reset the module or reset the module address.

There are two diodes **(F)** for every port. These indicate the status of pulse inputs A and B

One diode on each port indicates if that dispense point is open or not, **(G).**

If the diode **(H)** is flashing the module is operational and working properly. A steady light or completely off indicates a problem.

DIL-switch for termination and BIAS are located at **(I)**.

(J) shows the position of the replaceable communication driver.

If the **SetupLock** jumper at position **(K)** is removed, the PPU value (calibration) cannot be changed.

On version D there is a possibility to add an optional 6-channel digital I/O connector with +5VDC and GND, this is marked **(L)**.

4. Configuration

An Orilink® configuration sheet *should* always be filled or altered during the configuration.

NOTE! To obtain technical support a copy of the configuration sheet for the complete installation must be sent to Alentec & Orion AB at

Alentec & Orion AB
TECHNICAL SUPPORT
BOX 108
S-132 23 Saltsjö-Boo
SWEDEN

or

orilink@alentec.se.

4.1. Check before configuration

Check that the MPDM is working and communicating with the system according to the

Orilink® Manual chapter Testing modules.

NOTE! Do not forget to check and adjust the termination and BIAS according to Orilink® Manual.

4.2. Set-Up Lock jumper

On later MPDM boards there is a Jumper called SetupLock (revision C and D) if this jumper is removed or moved to only one of the pins some configurations are disabled. Which configurations that are disabled may vary depending on the chip software version. If you change a configuration from a keypad when the jumper is moved the change will not be stored. If you configure from a PC the locked parameters is greyed and the flag L is shown in the "Update PNP array" table.

4.3. Addressing the MPDM

A new module has a default address when delivered such as MPDM 1000, PM 2000, KP 3000, LED 4000 and so on. To set an address for a new MPDM or a MPDM with unknown address press and hold it's RESET button for 5 seconds to set a temporary address. Immediately enter set-up mode from a KP and type 0 and then ENTER to get to the Main menu of the MPDM, see below.

NOTE! **Only one new module can be installed at a time. If you press the RESET-button on several terminals simultaneously or in a sequence, only the most recently pressed will be active.**

TIP! **Follow preferably ”Recommendation for setting new addresses” when setting addresses.**

4.4. Set-Up mode

Type the word **”SETUP”** on a KeyPad and press **ENTER**.

Type the **password** and press **ENTER**.

```
Reel:SETUP      ‡
EXIT STOP CE ENT
```

```
PASS:_          ‡
Enter Password
```

Type the address for the MPDM that is to be configured and press **ENTER** to access its main menu. It is possible to add the 4-digit menu code to go directly to the desired menu.

```
Addr:1???_      ‡
Address[CODE]
```

Scroll through the MPDM sub menus by pressing ↑ or ↓. When the desired menu is shown press ENTER etc.

```
MPDM:           ‡
MPDM MainMenu
```

4.5. Change address *[MPDM//Address]*

Enter menu **[MPDM//Address]** by pressing **ENTER**.

Press **ENTER** to get the cursor.

```
MPDM:           ‡
MPDM MainMenu
```

Type in the **desired address** and acknowledge by pressing **ENTER**. When the cursor disappears it is finished.

Press **EXIT twice** to leave Set-Up mode.

```
Address:1XXX    ‡
Ange Adress 1???
```

NOTE! **If two or more MPDM's have the same address the system will fail. The MPDM's has to be re-addressed.**

```
Address:1XXX    ‡
Set Address 1???
```

TIP! **Follow preferably ”Recommendation for setting addresses” when setting addresses.**

4.6. Recommendation for setting addresses

Each module demands a unique 16 bit hexadecimal address. There are some forbidden and some reserved addresses but it is possible to use all addresses between 0001 and 9999. To make it easier to upgrade and support the system we recommend using the chart to the right.

Adress	Module
0000	Forbidden
1000 – 1xxx	MPDM
2000 – 2xxx	PM
2999	PC-database
3000 – 3xxx	KeyPad
4000 – 4xxx	LED-display
5000 – 5xxx	*Reserved*
6000 – 6xxx	*Reserved*
7000 – 7xxx	*Reserved*
8000 – 8xxx	TCM
A000 – FFFF	Forbidden

This means that the first MPDM should have the address 1001 and the next one 1002 etc. It is a good idea not to use the default address 1000, it makes it easier to add new MPDM's.

NOTE! **It is essential to add modules to the configuration sheet continuously as they are configured to avoid collisions.**

NOTE! **Address 0000 is forbidden and addresses above 9999 are reserved for the system.**

4.7. Change sphere *[MPDM//Snr]*

Spheres can be used to connect an MPDM exclusively to a certain workplace or department. This function is disabled if a OTP chip is used **(White label)** and enabled if a flash chip is used **(Yellow label)**. Se chapter *"Chip types"*.

```
MPDM:          ‡
MPDM MainMenu
```

NOTE! The sphere number is hard coded to 0 if the module is equipped with OTP (White lable) chip.

Enter menu **[MPDM//Address]** by pressing **ENTER**.

```
Address:1XXX   ‡
Set Address 1???
```

Scroll to menu Sphere: by pressing ↑ or ↓.

Press **ENTER** to get the cursor.

```
Snr:XXX        ‡
Set Sphere 0-255
```

Type in the **desired sphere** and acknowledge by pressing **ENTER**. When the cursor disappears it is finished.

```
Snr:XXX        ‡
Set Sphere 0-255
```

Press **EXIT twice** to leave Set-Up mode.

5. Administrate internal users (Only with specific software versions)

Observe ! This is only supported in really old software version or if the MPDM is flashed with a MPDM100nn_IUD (Internal User Database).

Eight users can be handled by one MPDM but only by PIN-code, this can be used in a small system.

5.1. Add a user [MPDM//IntUserDB/AddUser]

Enter menu **[MPDM//IntUserDB]** by pressing ↑.

```
MPDM:          ‡
MPDM MainMenu
```

At **IntUserDB:** press **ENTER**.

```
IntUserDB:     ‡
MPDM MainMenu
```

At **DelUser:** press ↓.

```
DelUser:       ‡
Delete User
```

At **AddUser:** press **ENTER**.

```
AddUser:       ‡
Add User
```

Type in the **PIN code** (4 figures) and acknowledge by pressing **ENTER**.

```
PIN:_          ‡
PIN ????
```

Type in **another PIN** code and press **ENTER** etc. or press **EXIT three times** to leave Set-Up mode.

```
PIN:_          ‡
PIN ????
```

NOTE! No confirmation is shown. Test it by opening a dispense using the new PIN codes.

5.2. Remove a user [MPDM//IntUserDB/DelUser]

Enter menu **[MPDM//IntUserDB]** by pressing ↑.

```
MPDM:          ‡
MPDM MainMenu
```

```
IntUserDB:     ‡
MPDM MainMenu
```

At **IntUserDB:** press **ENTER**.

At **DelUser:** press **ENTER**.

```
DelUser:       ‡
Delete User
```

Chose the PIN code to delete by scrolling with ↑ or ↓ and press ENTER to acknowledge.

```
PIN:XXXX       ‡
PIN ????
```

If the PIN-code to delete is shown press ENTER to delete it or type in the correct one and press ENTER.

```
XXXX           ‡
PIN ????
```

Choose the next PIN code to delete or press EXIT three times to leave Set-Up mode.

```
PIN:           ‡
PIN ????
```

NOTE! No confirmation is shown. Test it by opening a dispense using the deleted PIN codes.

6.   Configure the ports

A MPDM has four ports that are used to control four fully separate dispense points (Reels).

6.1.   Connect a dispense point to a port *[MPDM//PortX/ReelNo]*

Enter menu **[MPDM//PortX]** by scrolling with ↑ or ↓.

```
MPDM:            ‡
MPDM MainMenu
```

At **PortX:** press **ENTER**.

```
PortX:           ‡
MPDM MainMenu
```

Press **ENTER** to get the cursor.

```
Reel:X           ‡
Set ReelNo ???
```

Check the number of the reel that is connected to portX, type that number in and press **ENTER** to acknowledge. When the cursor disappears it is finished.

```
Reel:X           ‡
Set ReelNo ???
```

Press **EXIT twice** to leave Set-Up mode.

6.2.   Group [MPDM//PortX/Group]

A user can be a member of eight different groups named A-H. It is possible to make advanced and complex user rights for dispense points.

EXAMPLE: "Bob" is a member of groups AB, user "Stan" is a member of groups BC and the dispense points is divided into three bays A, B and C. In this case both users can open dispense points in bay B but only "Bob" can open dispense points in bay A and only "Stan" can open dispense points in bay C.

Each group is represented by a value shown in the chart to the right. The group value is calculated by adding the values for each desired group. Group A and E give a group value of (1+16) which are 17.

Group	Value
A	1
B	2
C	4
D	8
E	16
F	32
G	64
H	128

Enter menu **[MPDM//PortX/]** by scrolling with ↑ or ↓.

```
MPDM:            ‡
MPDM Huvudmeny
```

At **PortX:** press **ENTER**.

```
PortX:           ‡
MPDM Huvudmeny
```

Scroll to **Group:** using ↑ or ↓.

```
Reel:X           ‡
Set ReelNr ???
```

Press **ENTER** to get the cursor.

```
Group:XXX        ‡
Set Group 0-255
```

Type the **group value** and press **ENTER** to acknowledge. When the cursor disappears it is finished.

```
Group:XXX        ‡
Set Group 0-255
```

Press **EXIT twice** to leave Set-Up mode.

NOTE: Which group a user is a member of is set when administrating users.

6.3. Mask [MPDM//PortX/Mask]

How a dispense point should work is controlled by a mask. This is done by adding the values for the desired functions, in the chart to the right.

EXAMPLE: At a dispense point you want to use JOB number but you do not want to type in a desired volume or a PIN code. The meter has two reed switches and you want to use them. In this case you should add the values 2 and 16. 2+16=18. The mask should be set to 18.

Enter menu **[MPDM//PortX]** by scrolling with ↑ or ↓.

At **PortX:** press **ENTER**.

Scroll to **Mask:** using ↑ or ↓.

Press **ENTER** to get the cursor.

Type the **mask value** and press **ENTER** to acknowledge. When the cursor disappears it is finished.

Press **EXIT twice** to leave Set-Up mode.

Name	Value
Use PIN-code	1
Use JOB-no	2
Use Volume	4
Use Pulse compensation	8
Use two REED switches	16
Use Ext User Validation	32
Use Ext JOB Validation	64
Use Ext Tank Validation	128
Use Input B as a trigger	256
LED counts down	512
Dual/Quadra pulse count	1024

```
MPDM:           ‡
MPDM MainMenu
```

```
PortX:          ‡
MPDM MainMenu
```

```
Reel:X          ‡
Set ReelNo ???
```

```
Mask:XXX        ‡
Set Mask 0-3567
```

```
Mask:XXX        ‡
Set Mask 0-3567
```

```
Mask:XXX        ‡
Set Mask 0-3567
```

6.3.1. Use PIN code

Sets if the dispense point should ask for a PIN code input or not.

6.3.2. Use JOB no

Sets if the dispense point should ask for a Workorder/JOB code input or not.

6.3.3. Use Volume

Sets if the dispense point should ask for a volume input or not. If set the dispense point will ask for a volume to dispense. If not set the dispense point will open for the volume defined in MaxVol.

6.3.4. Use Pulse compensation

Sets if the dispense point should auto adjust for after run. If it is set the dispense point will adjust the valve shut-of to compensate for flow and temperature changes.

6.3.5. Use two REED switches

Enables/Disables the use of a meter with two REED switches (Two pulse train output). If a meter with two pulse trains (Alentec & Orion AB part no. 24738) is used and "Use two REED switches is enabled the flow direction will be detected.

This cannot be used if "Use Input B as a trigger" is set.

6.3.6. Use external User Validation

If this is set the dispense point will validate the PIN code to the source specified in DbAddress. If it is not set the dispense point will validate the PIN code to the internal PIN code database of the MPDM.

6.3.7. Use external JOB validation

If this is set the dispense point will validate the Work order/Job number to the source specified in DBAdress. If it is not set the dispense point will only register the Work order/Job number but not validate it.

6.3.8. Use external Tank validation

If this is set the dispense point will validate the Requested volume to the specified Tank number at the source specified in DBAdress. If the "Current Stock" minus the "Requested Volume" is above the specified "Stop Volume" the dispense point will open.

6.3.9. Use Input B as a trigger

If this parameter is set it enables the use of an external signal connected to the Input B pin of the port connector.

The function is active low and can be done with a push button connected between Input B and GND of the port connector.

When Input B goes low the dispense point will open for the volume specified by the MaxVol parameter.

This cannot be used if "Use two REED switches" is set.

6.3.10. LED counts down

Sets if the LED specified by the parameter LEDAdress should count the dispensed volume forwards or backwards, 0 -> Requested volume or Requested volume ->0.

6.3.11. Dual/Quadra pulse count

This sets if the pulse input of the dispense poin should count only rising edge or rising and falling edge of the pulse train. If a single pulse train meter is used the PPU will be doubled and if a two pulse train meter is used the PPU will increased 4 times.

This can be used to increase accuracy for grease dispensing and large meters with low PPU.

6.3.12. Cyclic Dispense mode

If this is set the dispense point dispenses the volume specified by the MaxVol parameter with a time interval specified by the Time-Out parameter in minutes. Then the normal Time-Out for the dispense point is hard coded to 30 seconds. If there is an error it is possible to get an error signal output on the optional I/O connector on the MPDM board rev 2030262D.

6.4. Set "Time-Out" function *[MPDM//PortX/TimeOut]*

The function Time-Out set the time for how long a dispense point should be open if no fluid is taken. After the time-out time the solenoid valve shuts automatically. As soon as fluid is passing the meter the time will start from 0. The value is in seconds.

If the dispense point is set to "Cyclic Dispense mode" the dispense interval is in minutes and the normal Time-Out is hard coded to 30 seconds.

Enter menu **[MPDM//PortX]** by scrolling with ↑ or ↓.

```
MPDM:          ‡
MPDM MainMenu
```

At **PortX:** press **ENTER**.

```
PortX:         ‡
MPDM MainMenu
```

Scroll to **Timer:** using ↑ or ↓.

```
Reel:X         ‡
Set ReelNo ???
```

Press **ENTER** to get the cursor.

```
Timer:X        ‡
1-255 Min 0=Off
```

Type the number of minutes, 0=OFF max 255, the dispense point should be open without being used press **ENTER** to acknowledge. When the cursor disappears it is finished.

```
Timer:X        ‡
1-255 Min 0=Off
```

Press **EXIT twice** to leave Set-Up mode.

```
Timer:X        ‡
1-255 Min 0=Off
```

6.5. Calibrating [MPDM//PortX/PPU]

If the **SetupLock** jumper is removed it is not possible to change the PPU value. If it is done from a KeyPad a new value can be typed in but it will not change the present value. In properties for a reel in a PC system the PPU field will be greyed out and not selectable.

6.5.1. Manual

Meters generate pulses according to the amount of fluid that has passed. By opening a dispense point for a certain amount of fluid and then compare how much that has been dispensed (RECORDED) to how much fluid you really received (RECEIVED) you will know if the meter is calibrated or not. If you receive more than the requested amount the PPU value should be decreased and increased if you received less (see formula below). The system default is set to the Orion meter 24728 which generate 328 pulses per litre. If another meter is connected it must be calibrated to dispense the correct requested amount.

$$PPU_{New} = PPU_{Present} \bullet \frac{RECORDED}{RECEIVED}$$

NOTE! **Be very thorough when the received volume is measured because a small error at calibration can result in a large volume error at large volume. Use an accurate measuring vessel that is completely empty and make sure that all visible air is gone before the vessel is read.**

Enter menu **[MPDM//PortX]** by scrolling with ↑ or ↓.

At **PortX:** press **ENTER**.

```
MPDM:          ‡
MPDM MainMenu
```

Scroll to **PPU:** using ↑ or ↓.

```
PortX:         ‡
MPDM MainMenu
```

Press **ENTER** to get the cursor.

```
Reel:X         ‡
Set ReelNo ???
```

Type the **number of pulses per unit**, max 5000, for the meter connected to the port and press **ENTER** to acknowledge.

```
PPU:XXX        ‡
Set PPU 1-5000
```

When the cursor disappears it is finished.

```
PPU:XXX        ‡
Set PPU 1-5000
```

Press **EXIT twice** to leave Set-Up mode.

```
PPU:XXX        ‡
Set PPU 1-5000
```

6.5.2. Semi automatic

The semi automatic method was developed after that OriLink® WinTools R8 was released. To use it the following must be present.

The MPDM must have Chip software 1.00.10RC19 recommended version is 1.00.10RC32

The LED100 (old type without clock module sockets) must have chip software 1.00.06RC12 recommended version is 1.00.06RC27

The LED101 must have chip software 1.01.04RC12 recommended version is 1.01.04RC27.

The keypad must have chip software 1.00.010RC17

The PC must have REEL100.ocx version 1.09RC3 and KP100.ocx version 1.09RC3

Open the dispense point for a volume (normally not less that 2 L) and dispense. When the dispense point is closed, and before it is used again, go to the **PPU:** value for this dispense point either on a keypad or in properties on the PC. Type in the received volume with a leading "-" sign like "-1.45" followed by <ENTER>. The dispense point will then calculate the proper PPU value.

For keypad "-" is two times ↓ (yellow arrow down) and then the "?" button.

Make one more dispense to verify that it is now correct.

6.5.3. Decimal PPU

If a MPDM is flashed with a chip software named MPDM……..(PPUFloat).bin it will support the use of decimal (float number) PPU.

Decimal PPU: looks like this "326.54" compared to integer PPU: like 326.

To be able to set decimal PPU the keypad must have chip software 1.00.10RC17 and the PC must have the REEL100.ocx version 1.09RC3.

6.6. Set volume intervals [MPDM//PortX/MinV] and [MPDM//PortX/MaxV]

Enter menu **[MPDM//PortX]** by scrolling with ↑ or ↓.

```
MPDM:          ‡
MPDM MainMenu
```

At **PortX:** press **ENTER**.

```
PortX:         ‡
MPDM MainMenu
```

Scroll to **MinV:** using ↑ or ↓. (Or scroll directly to MaxV:)

```
Reel:X         ‡
Set ReelNo ???
```

Press **ENTER** to get the cursor.

```
MinV:X.XX      ‡
Min Vol ??.??
```

Type the **smallest volume**, min 0,5, to be dispensed from this dispense point and press **ENTER**. When the cursor disappears it is finished.

```
MinV:X.XX      ‡
Min Vol ??.??
```

Press ↓ to **MaxV:** (Or press EXIT two times to leave Set-Up mode.)

```
MinV:X.XX      ‡
Min Vol ??.??
```

Press **ENTER** to get the cursor.

```
MaxV:X.XX      ‡
Max Vol ????.??
```

Type the **largest volume**, min 0,5 max 9999,99, to be from this dispense point and press **ENTER** to acknowledge. When the cursor disappears it is finished.

```
MaxV:X.XX      ‡
Max Vol ????.??
```

Press **EXIT twice** to leave Set-Up mode.

```
MaxV:X.XX      ‡
Max Vol ????.??
```

6.7. Validation of JOB number

MPDM dispense points create dispense records for entered job numbers entered when a dispense is done.

If there is a Printer module in the system or if WinDB service is loaded in a PC system, an entered job number can be validated against a JOB number database, Se also **6.3. Mask**.

7. Connect a dispense point to information modules

Each port can be separately connected to a display <LED:> and a ticket printer <Printer:> / database <DB:>. This means that a dispens can be shown on a LED display during dispensing and show the received volume after dispense is finished. Information about dispenses can be stored in a database and printed. To connect information module to a port the address should be set at the correct place in the port menu.

7.1. Connect a dispense point to a Printer/Database module *[MPDM//PortX/DB]*

Enter menu **[MPDM//PortX]** by scrolling with ↑ or ↓.

```
MPDM:           ‡
MPDM MainMenu
```

At PortX: press ENTER.

```
PortX:          ‡
MPDM MainMenu
```

Scroll to **DB:** using ↑ or ↓.

```
Reel:X          ‡
Set ReelNo ???
```

Press **ENTER** to get the cursor.

```
DB:2???         ‡
DB Address 2???
```

Type the **address** to the desired DB module and press **ENTER** to acknowledge. When the cursor disappears it is finished.

```
DB:2???         ‡
DB Address 2???
```

Press **EXIT twice** to leave Set-Up mode.

NOTE! Each information module can be connected to multiple ports.

```
DB:2???         ‡
DB Address 2???
```

In MPDM version MPDM10010 or later the use of a secondary database is supported. Due to the limited memory resources of the MPDM the prompt for this is the same as for the primary database but it comes after the Tank parameter.

The secondary database can be used for local printing and transaction backup storage.

7.2. Connect a dispense point to a LED module *[MPDM//PortX/LED]*

Enter menu **[MPDM//PortX]** by scrolling with ↑ or ↓.

```
MPDM:           ‡
MPDM MainMenu
```

At PortX: press ENTER.

Scroll to **LED:** using ↑ or ↓.

```
PortX:          ‡
MPDM MainMenu
```

Press ENTER to get the cursor.

```
Reel:X          ‡
Set ReelNo ???
```

Type the **address** to the desired LED module and press **ENTER** to acknowledge. When the cursor disappears it is finished.

```
LED:4???        ‡
LED Address 4???
```

Press **EXIT twice** to leave Set-Up mode.

```
LED:4???        ‡
LED Address 4???
```

```
LED:4???        ‡
LED Address 4???
```

7.3. Set number of decimals on a LED module *[MPDM//PortX/NoDec]*

Enter menu **[MPDM//PortX]** by scrolling with ↑ or ↓.

```
MPDM:            ‡
MPDM MainMenu
```

At PortX: press ENTER.

```
PortX:           ‡
MPDM MainMenu
```

Scroll to **LED:** using ↑ or ↓.

```
Reel:X           ‡
Set ReelNo ???
```

Press ENTER to get the cursor.

```
NoDec:2          ‡
LED Address 4???
```

Type how many decimals that should be shown for the port and press **ENTER** to acknowledge.

```
NoDec:2          ‡
LED Address 4???
```

When the cursor disappears it is finished.

```
NoDec:2          ‡
LED Address 4???
```

Press **EXIT twice** to exit Mode-mode

Note! The number of decimals will automatically decrease to fit in the display if needed. Setting number of decimals to 255 will result in 2 decimals.

7.4. Connect a dispense point to a tank *[MPDM//PortX/Tank]*

If there is a printer module in the system, a dispense point can be connected to one of max 8 tanks per PM. In this case the system will be able to check if there is enough oil in the tank and subtract the oil dispensed from it.

Enter menu **[MPDM//PortX]**, scroll with ↑ or ↓.

```
MPDM:            ‡
MPDM MainMenu
```

Press **ENTER**.

```
PortX:           ‡
MPDM MainMenu
```

Scroll to **Tank:** using ↑ or ↓**.**

```
Reel:X           ‡
Set ReelNo ???
```

Press **ENTER** to get the cursor

```
Tank:X           ‡
Set TankNo
```

Type which tank is connected to the port and press **ENTER** to acknowledge.

```
Tank:X           ‡
Set TankNo
```

When the cursor disappears it is finished.

```
Tank:X           ‡
Set TankNo
```

Press **EXIT twice** to exit Mode-mode

8. Menu tree.

```
SETUP <enter> ───────────▶ Adress:1XXX <ENTER>
                                   │
                                   │              ┌──────────▶ <EXIT> ◀──────────────────────────┐
                                   │              │                                              │
                                   ▼              │                                              │
            ┌──────────────▶ MPDM: ──────────▶ <ENTER> ──────────┐                               │
            │                    │                                │                               │
            ▼                    ▼                                ▼                               │
          ↓/↑                 <EXIT>                          Adress: ──────▶ <ENTER>            │
            │                    │                                │              │                │
            │                    │                                │              ▼                │
            ▼                    │                                │          Address:1???         │
        Port1: ◀──── <ENTER> ───────────┐                        │              │                │
            │         │                  │                        │              ▼                │
            │         │                  │                        │          <ENTER>              │
            ▼         └──▶ <EXIT> ◀──────┤                        │                               │
        Port2:                          │                        ▼                                │
            │              <EXIT>        │                     Sno: ──────────▶ <ENTER>           │
            ▼                            │                        │               │               │
        Port3:                          │                        │               ▼               │
            │                           │                        │            Sno:_              │
            ▼                           │                        │               │               │
        Port4:                          │                        │               ▼               │
            │                           │                        │            <ENTER>            │
            ▼                           │                                                         │
      IntUserDB: ◀──── <ENTER>          │                                                         │
            │              │            │                                                         │
            │              │            │            Reel: ──────────▶ <ENTER>                   │
            │         <EXIT> ◀──────────┤               │                 │                       │
            │              │            │               ▼                 ▼                       │
  <ENTER> ◀── DelUser: ◀───┤          Group:          Reel:               │
      │          │         │            │                 │               │
      │        <EXIT>      │          Mask:           <ENTER>             │
      ▼          │         │            │                                 │
    PIN: ◀───────┘         │          Timer:                             │
      │                    │            │                                 │
   <ENTER>                 │           PPU:                               │
      │                    │            │                                 │
      ▼                    │          MinV:                               │
      _                    │            │                                 │
      │                    │          MaxV:                               │
   <ENTER>                 │            │                                 │
                           │           DB:                                │
  <ENTER> ◀─ AddUser: ─────┤            │                                 │
      │          │         │          Led:                                │
      │        <EXIT>      │            │                                 │
      ▼          │         │          NoDec:                              │
   PIN:_ ◀───────┘         │            │                                 │
      │                    │          Tank:                               │
   <ENTER>                 │            │                                 │
                           │           DB:        (Secondary)             │
                        Reel:_
```

9. Fast Menu codes

With a PC and the OriLink® WinTools software and a SIO, you can customize the quick menu that appear when you press "?". To do this, assign a name to the menu, a module address and then a code. Password is optional. This code can also be used together with the address after you have typed SETUP followed by the password.

For an MPDM-module it will look like this,

New user   10000062   YYYYY   where YYYYY=password

Part	Function	Address	Code	Comment
Main menu	Change address		0800	
	Change Sphere		0801	
	Reboot		0802	Not from keypad only from command line OLSET address 0802 22 R
Ports	Change Dispense point Nr.		0X00	Where X is the port number
	Change Group		0X01	Where X is the port number
	Change Mask		0X02	Where X is the port number
	Change Time-Out		0X03	Where X is the port number
	Change PPU		0X04	Where X is the port number
	Change Min Volume		0X05	Where X is the port number
	Change Max Volume		0X06	Where X is the port number
	Change DB address		0X07	Where X is the port number
	Change LED address		0X08	Where X is the port number
	Change Tank number		0X09	Where X is the port number
	Change Number of decimals		0X10	Where X is the port number
	Set Secondary DB address		0X11	Where X is the port number
	Directly to dispense input		0X20	Where X is the port number
User DB	Remove user		0061	
	Add user		0062	

10. Technical specification

Printed circuit board

Net ports:	5 OriLink® ports (A) for data communication, 2 without +24VDC.
Meter inputs:	4 (E) 32 bit for one or two pulse signals. Switch or active signal max 45 V. Supports flow direction and phase error detection.
Control outputs:	4 (F) for solenoid 24 VDC max 1,25 A. Closes after about 30 s when short circuited, this is logged in the database.
Digital I/O:	(L) An optional 8-pin I/O connector with +5V, 6 pcs D-I/O and GND that can be used by PLC code, Cyclic dispense mode and/or Script.
Other:	RISC-based microprocessor EEPROM, 64 KB. Connector (C) for 24 VDC 6.3A power supply. Connector (E) for 3-pos key switch.
Fuses:	T6.3 A (D) and F1.6A (B)
Max current:	500 mA + 4x1.25 A for solenoid valves.

Casing

Power supply:	Primary 230 VAC / 50Hz / Fuse T630mA.
Casing:	Strong black powder painted steel box
Outer measures:	303 x 228 x 65 mm.
Fitting:	4 x ø5mm CC = 250 x 175 mm
Weight:	3,9 kg.

Environment

Use:	Indoors in dry areas. Temperature range 0-55°C
Transport:	Dry –10-80°C
Storage:	Dry –10-80°C
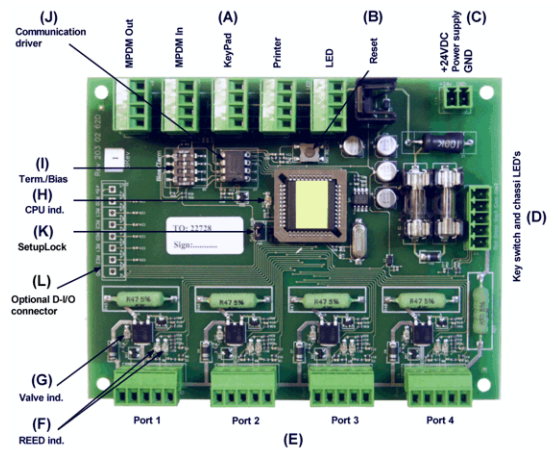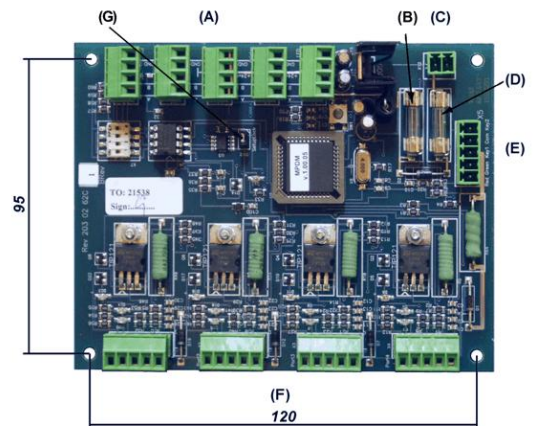
11. PM PCB mounted in a MPDM box

In a small system or at limited space it is possible to mount a printer / database module PCB in a MPDM. To do this the MPDM PCB has to be moved and turned one quarter of a turn. The plastic distances by packed with the PM are a little shorter than the ones for the MPDM PCB and they shall be used for the PM. The PM should be mounted towards the key switch. *See pictures below:*

Make sure that the MPDM is disconnected from the mains power supply and the **ORILINK®** network before any work is started. Use a voltmeter to make sure that there is no power in the MPDM

This is how the standard MPDM looks like inside.

Turn the MPDM PCB a quarter of a turn and place it at the top of the box. Move the plastic distances to the holes that makes it possible to place the PCB as shown in the picture to the left. Do not damage the cabling.

Fasten the short plastic distances so the new card can be placed closest to the bottom like in the picture. The printer module cable is then easily installed in the correct position.

12. Pre-programmed amounts with a MPDM

A MPDM can be configured as one dispense point with 5 or 7 programmable pre-set volumes. Connecting Port1 B or Port2 A, and so on to Port4 B low, activates these options. This can be done with an external power switch or some other control equipment like a PLC. Status signals about an initiated dispense can be received; status shows "Dispense successful", "Dispense error", and "Dispensing..."

You can also activate a dispense point using a regular KeyPad. A LED display can be used to monitor the dispense and a printer module can be used to store and print the result.

12.1. Connect a MPDM to dispense pre-programmed amounts

Connect meter and solenoid valve to MPDM Port1:

NOTE! Only one REED-switch can be connected.

Connect momentary switches or some other control equipment between **GND** and the **Input** for the pre-programmed option (max 7) as shown in the table to the right.

Option	Port	Input	Volume
1	1	B	VolMAX
2	2	A	VolMIN
3	2	B	VolMAX
4	3	A	VolMIN
5	3	B	VolMAX
6	4	A	VolMIN
7	4	B	VolMAX

12.2. Configure a MPDM to dispense pre-programmed amounts

The MPDM ports are configured as follows.

Port1:　　　　INP B as trigger, add 256 to mask
Set PPU to the PPU for the used meter
Set MaxV to desired Option 1

Port2:　　　　INP B as trigger, add 256 to mask
Set PPU to 0 (zero)
Set MinV to desired Option 2
Set MaxV to desired Option 3

Port3:　　　　INP B as trigger, add 256 to mask
Set PPU to 0 (zero)
Set MinV to desired Option 4
Set MaxV to desired Option 5

Port4:　　　　INP B as trigger, add 256 to mask
Set PPU to 0 (zero)
Set MinV to desired Option 6
Set MaxV to desired Option 7

12.3. Status information

Example: Light a GREEN LED if the dispense is successfully completed or a RED LED if the dispense is aborted for some reason. Connect a GREEN LED to Port2 and a RED LED to Port3 in the same way as a solenoid valve is connected.

Port	Output	Function	Status
2	Sol	Active Low	OK
3	Sol	Active Low	ERROR
4	Sol	-	Not used

The status of the port will change as soon as a new dispense is initiated.

12.4. Start, stop and reset function.

(Chip version 1.00.02 or later)

If needed the MPDM can be set to supply start, stop and reset function. Because of that INP A/B is used for this only 5 pre-sets can be used. The function is activated by setting PORT4 PPU=65535. The function is then,

INP A = Starts the chosen dispense.

INP B = Stops the running dispense (gives ERROR signal on SOL Port 3)

　　　　Resets ERROR signal when a dispense did not complete properly.

13. Using the MPDM as a PLC (Programmable Logic Controller)

If the MPDM is equipped with a FLASH chip and the software version is 1.00.09 or later PLC code can be used to customize the functionality. To be able to input PLC code OriLink® WinTools R8 or later is needed. There are no needs for a PC to use the MPDM as a PLC only to program it. The PLC code is builtl on "ladder" code/diagram.

Because of that this is a new feature added there are some limitations at this point

Only a smaller amount of code can be used at this point, about 240 byte.

Note !   **The PLC code is currently loaded in the module RAM and is because of this erased at RE-Boot!**

13.1. Possible Inputs / Outputs

Device	Direction	Type	Physical location	PCB / Note
p1o-p4o	Output	Control max 1.25 [A]	5-pole port connector	
p1ps-p4ps	Output	Starts a dispense of the set MaxVol	Internal	
p1close-p4close	Output	Stops a dispense	Internal	
p1a-p4a	Input	Signal	5-pole port connector	
p1b-p4b	Input	Signal	5-pole port connector	
p1s-p4s	Input (Read)	Detect status	Internal	Obsolete
rc0-rc2	Input/Output	Signal	Optional 6-pole connector	2030262D
re0-re2	Input/Output	Signal	Optional 6-pole connector	2030262D
r1-r9	Input/Output	Virtual relays	Internal	
r1tSS-R9tSS	Input/Output	Virtual timer relays	Internal	SS in seconds
init		Start bit	Internal	
sopen	Input	Detect status	Key switch	

13.2. Supported operations

LD [NOT] i	Loads the C register with value of device "i".
AND [NOT] i	Logic AND of C and the value of device "i", the result is stored in C
OR [NOT] i	Logic OR of C and the value of device "i", the result is stored in C
XOR [NOT] i	Logic XOR of C and the value of device "i", the result is stored in C
OUT [NOT] o	Loads device "o" with the data in the register C
pXopen	Opens a dispense point (PortX) with the loaded data.
pXclose	Closes a dispense point (PortX), generates a transaction.

13.3. Sample PLC coded functions

To make it easier to start up the use of the PLC feature this chapter gives som e examples of the use of it.

13.3.1. Activate p4o with p4a for 60 s use r1

LD p4a OUT r1t60

LD r1 OUT p4o

13.3.2. Activate p4o with p4a for 10 s, if p4b is OFF Use r1 and deactivate p4o

LD p4a OUT r1t10

LD r1 AND NOT p4b OUT p4o

13.3.3. Flipp-flopp for p3o

LD p3a OR p3o AND NOT p3b OUT p3o

13.3.4. Timed cascade coupling of Port1.

Description

(P2=ON) when P1 is ON plus 5 s (Prolonged MV1 pulse)
(P3=ON) when P2 goes OFF plus 5 s (Pulse after prolonged MV1 pulse)
(P4=ON) when P3 goes OFF plus 5 s

Code

LD p1o OUT r1t5
LD r1 OUT r2t5
LD r2 OUT r3t5
LD r3 OUT r4t5
LD r1 OUT p2o
LD r2 AND NOT r1 OUT p3o
LD r3 AND NOT r2 OUT p4o

13.3.5. Start a pump p4o if the system is opened and activate p3o if it is closed

LD sopen
OUT p4o
OUT NOT p3o

13.3.6. Start control for a system with two pumps

Description

Start the pump p3o if the system is online.
Start the pump p4o if the system is online and the safety switch rc0 is ON

Code

LD sopen
OUT p3o
AND rc0
OUT p4o

14. Chip types.

From the start of OriLink® in 1997 all modules have been equipped with an OTP processor Microchip 16C67. OTP means One Time Programmable. To day the flash technique has come to a point were we can use it for OriLink®.

Alentec & Orion AB has worked intensely since the summer 2004 to convert and enhance the software for OriLink® modules to safely make use of the flash technology. The chip used is a Microchip 18F452.

In this development we have also made it possible to upgrade existing modules to use the flash technology by only changing the chip combined with a simple reprogramming of the chip language.

14.1. Demands on a Non-PC system.

The only demand is that you must use a PC and a SIO (PC-interface 23 403) to reprogram the language of the modules.

14.2. Demands on a PC system.

The PC must be running OriLink® WinTools R7 to make it possible to se the modules on the PC.

If the PC is running R6 it can easily be updated to R7.

Earlier versions must be replaced by R7, contact an Alentec & Orion representative for advice.

14.3. How to see the difference between chip types .

If a module is equipped with a flash chip it is shown by a yellow label on the chip.

14.4. What is the benefit of the flash chip.

No need for changing the chip for upgrading. The module software upgrade is a file you put on the hard drive of a PC. The upgrading is then done through the OriLink® WinTools software package.

The flash chip used is faster and have more advanced features than the old chip. This gives the possibility to make the modules more powerful.

The flash chip has about 4 times more software memory. gives the possibility to add more functions.