Quick Start Guide

IVM6000™- LP

Intelligent Valve Monitor™

Line Powered Version

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October 2020

IVM6000™ QUICK START – STEP 1

Installation of the IVM6000™ is very quick and easy.
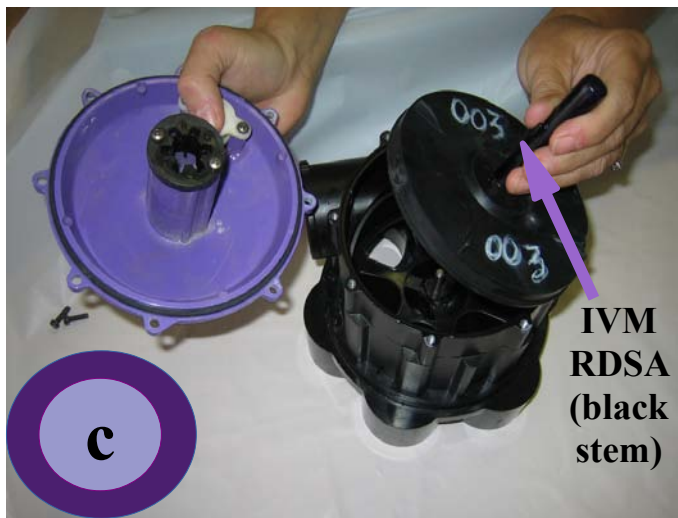
Step 1   Replace the original **rubber disk and stem assembly** (RDSA) with the one supplied with the monitor. The IVM RDSA contains special magnetic sensors which are detected by the monitor.

Remove valve top

Remove original RDSA

Replace with IVM sensor RDSA

Replace valve top

NOTE:
Ferromagnetic materials (such as cast iron pipe or fittings, screws, nails, rebar or other metal items) should not be placed in close proximity to the valve or monitor as these could cause incorrect operation.
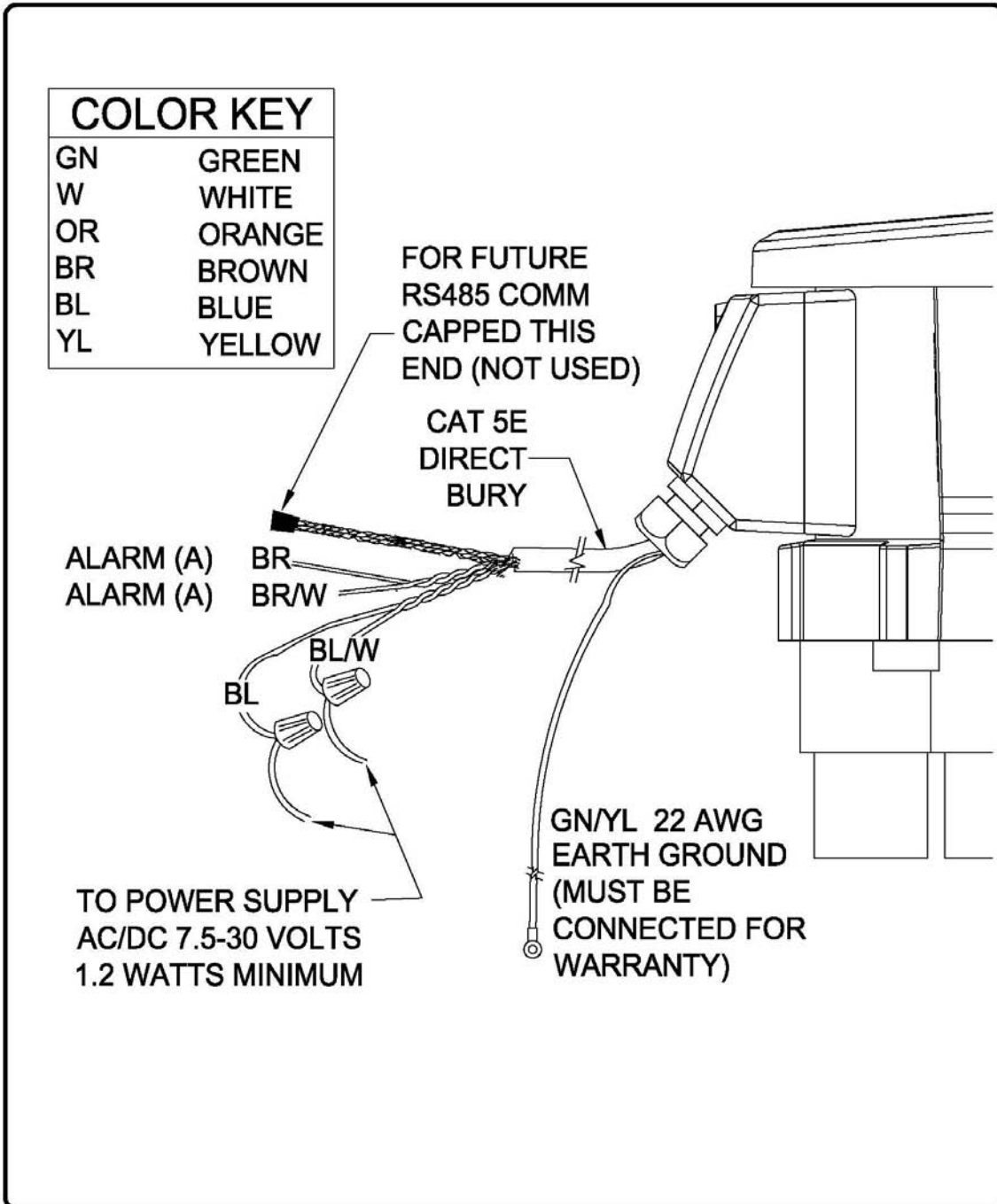
IVM6000™ QUICK START – STEP 2

Step 2   Line up the opening in the monitor case with valve inlet pipe, and lower the IVM straight down over the valve. In its final position the IVM6000™ must rest flush on the top of the ABS plastic valve base.

Line up IVM inlet over valve inlet

Lower IVM down over valve

IVM in final position

Ensure IVM is sitting flush with the top of ABS plastic valve base

IVM6000™ QUICK START – STEP 3

Step 3   Supply IVM with line power and connect alarm wires to pump controller or alarm power. A wiring diagram for the IVM is shown below.

COLOR KEY

GN	GREEN
W	WHITE
OR	ORANGE
BR	BROWN
BL	BLUE
YL	YELLOW

FOR FUTURE RS485 COMM CAPPED THIS END (NOT USED)

CAT 5E DIRECT BURY

ALARM (A)   BR
ALARM (A)   BR/W

BL/W

BL

TO POWER SUPPLY
AC/DC 7.5-30 VOLTS
1.2 WATTS MINIMUM

GN/YL 22 AWG
EARTH GROUND
(MUST BE
CONNECTED FOR
WARRANTY)

TITLE	DWG NO
IVM Wiring Diagram	C2-131

SCALE	CHK	DRAWN BY	DATE
NTS	KAG	CEM	July 8, 2014

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IVM6000™ QUICK START – STEP 4

Step 4   Set up the IVM6000 for your project and valve. First set the Time **(24 Hour Clock format)** and Date. To do this, press the "PAGE" button (see below) on the keypad several times until you cycle through to the "ADMIN MENU". Choose the Time/Date menu item and make any needed changes. When finished, press the "PAGE" button to return to the "ADMIN MENU".

PAGE Button:
Cycles through the various
menu pages/screens.

OK button used to
enter or select
menu items

ALARM Button:
Used to clear alarms, warnings, and
to test the alarm contacts at any time.

UP/DOWN Buttons:
Used to navigate
through Pages.
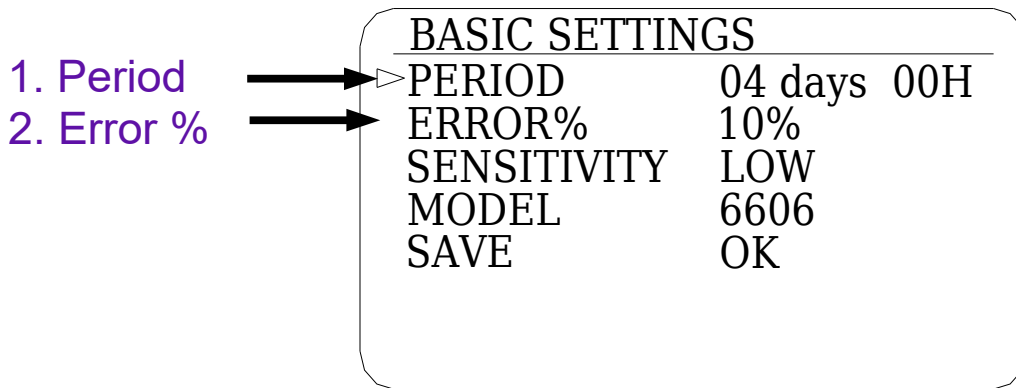
Set Time/Date first
in ADMIN MENU
(24 Hour Clock format)

Then proceed to the
BASIC SETTINGS page

ADMIN MENU
  VERSION
  CLEAR
  TIME/DATE
  POWER MENU
  BASIC SETTINGS
  ADVANCED SETTINGS
  TEMP. SETTINGS

IVM6000™ QUICK START – STEP 5
BASIC SETTINGS SUB-MENU

Step 5a   Use the "DOWN" button and "OK" button to select the "BASIC SETTINGS" sub-menu from the "ADMIN MENU". Verify that all the "BASIC SETTINGS" are correct or as desired for your system, especially the valve **MODEL** (see next page).

1. Period →
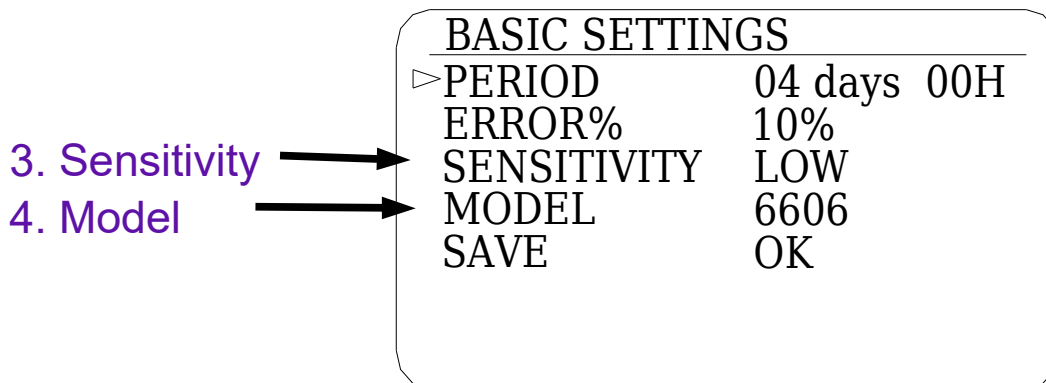2. Error % →

```
┌─────────────────────────────┐
│  BASIC SETTINGS             │
│ ▷PERIOD        04 days  00H │
│  ERROR%        10%          │
│  SENSITIVITY   LOW          │
│  MODEL         6606         │
│  SAVE          OK           │
│                             │
└─────────────────────────────┘
```

Keypad functions

UP/DOWN:	Change value/menu item
OK:	Confirm value/Select menu item
PAGE:	Go to next screen

1. Period: The rolling time period over which the unit calculates the **percentage on-time** and % **deviation** for each outlet. In this example, data within the last 4 days will be used in the calculation. Alarms are checked at 1/5th this period. Default value is 30 days.

2. Error %:   The maximum allowable percent deviation from equal distribution for all outlets. Ideally an equal amount of time is spent on each outlet. The error % control allows an adjustment of when an error should be signalled. In the above example, a 4 outlet valve should spend 25% of the time on each outlet, so the 10% allowable deviation means that the value for each outlet must fall between 15% and 35%. Anything outside of this range results in a "percent deviation exceeded" (PCT DEV) error condition.

Select "SAVE" then "OK" , after making any changes.
saved will appear briefly on the screen to confirm your changes are saved.

IVM6000™ QUICK START – STEP 5 cont'd

Step 5b   Verify that all the other "BASIC SETTINGS" are correct or as desired for your system, especially the valve **Model** (see below).

```
 _____
|   BASIC SETTINGS               |
| ▷PERIOD          04 days  00H  |
|  ERROR%          10%           |
|  SENSITIVITY     LOW           |
|  MODEL           6606          |
|  SAVE            OK            |
|                                |
|_____|
```

3. Sensitivity ➞
4. Model ➞

Keypad functions

UP/DOWN:	Change value/menu item
OK:	Confirm value/Select menu item
PAGE:	Go to next screen

3. Sensitivity: Choose from: **"OFF" "LOW" "MED" "HIGH.** This setting will determine which errors or warnings will **trigger an alarm**. LOW is the default setting, and will trigger an alarm based primarily on the % deviation of flow from one outlet to the other. Choose MED or HIGH if a greater level of alarm sensitivity is desired.

All errors and warnings are logged regardless of the sensitivity setting. Table 1 (See Appendix) summarizes all the different event and alarm types, codes and provides interpretation and trouble shooting suggestions. Table 2 (See Appendix) out lines the number of times an event has to occur to trigger an alarm for the different sensitivity settings.

4. Model: The current valve model and configuration. In the above example a 6606 is selected which is a 6 outlet valve with 6 active outlets. A 6403 is a 4 outlet valve with 3 active outlets, etc. **Ensure this setting reflects the valve model and number of outlets for your installation.**

Select "SAVE" then "OK" , after making any changes.
saved will appear briefly on the screen to confirm your changes are saved.

IVM6000™ QUICK START – STEP 6

Step 6a   Press the "PAGE" button to cycle through to the main page showing valve status. More information on this page and other pages can be found in the Appendix.

```
1: 17%          ( 2 )  ( 3 )
2: 17%
3: 16%      ( 1 )  ●  ( 4 )
4: 17%
5: 16%          ( 6 )  ( 5 )
6: 17%

OK  000
```
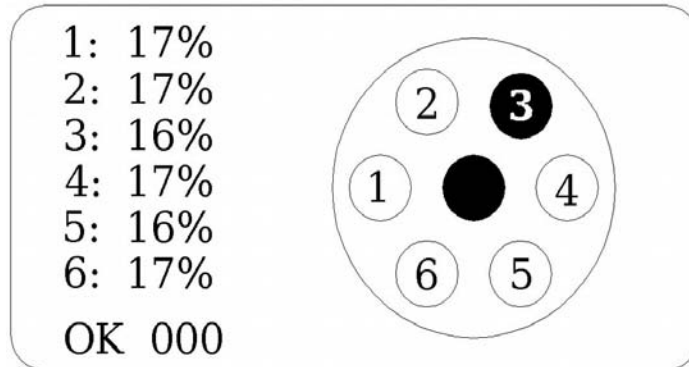
Main page showing valve status and percent distribution among the outlets.

Step 6b   Verify that the alarm activates at the pump controller or alarm panel by pressing the "alarm" button on the keypad .
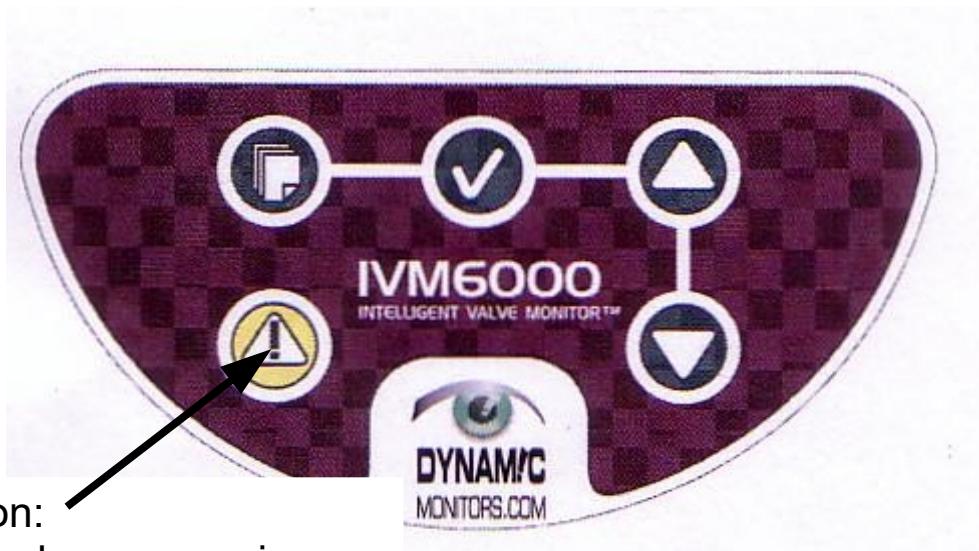
ALARM Button:
Used to clear alarms, warnings,
and to test the alarm at any time.

The IVM alarm relay is by default, "normally open.
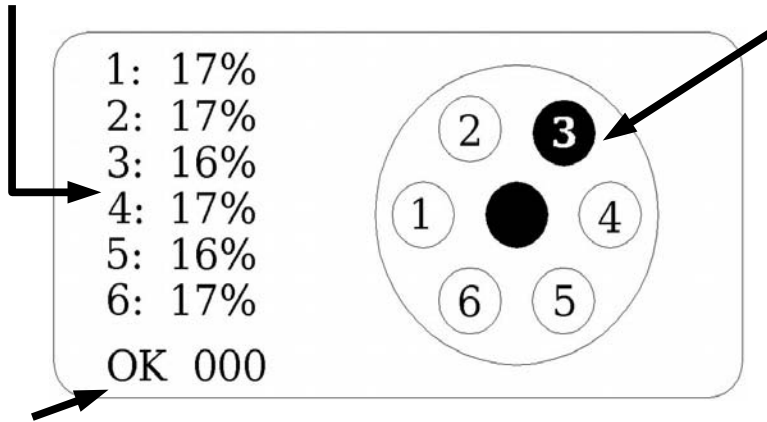*It closes when there is an alarm condition.*

CONGRATULATIONS!
Your IVM6000-LP is set up and ready to give you peace of mind.

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APPENDIX

VALVE STATUS Page

1.Outlet # and percentages

3. Current outlet status (outlet 3 is active in this example)

```
1:  17%
2:  17%
3:  16%
4:  17%
5:  16%
6:  17%

OK  000
```

2. Alarm status

Keypad functions

      PAGE: Go to next screen

      ALARM: Toggle the alarm contacts on/off.

1.	Outlet on-time percentages:	The percentage of time that each outlet has been on (dosed) during the sampling period. If the system is functioning ideally, these should be almost equal.
		For a 6 outlet valve (shown above), the percent distribution to each outlet should be approximately 16% to 17% if the valve is dosing all zones evenly. For a 4 outlet valve, the percent distribution should be approximately 25%.
2.	Alarm status:	Displays the alarm condition. OK means everything is fine, WARN means that there is a warning condition, ERR means that there is an alarm condition and the alarm relay output has been activated. See Table 1: IVM6000 Alarm Status Reference Table for a list of the various alarms, warnings and events.
3.	Current outlet status:	Shows a graphical representation of the valve and activity. The center circle represents the inlet, while each numbered circle represents an outlet. A filled/dark circle represents activity, while a clear circle represents inactivity. In this example of normal operation, both outlet #3 and the inlet are active.

TOTALS Page

1.Category

2b. Total time column

```
        PER       [TIME]    TOTAL
      1:000021001        003344343
      2:000021221        003445621
      3:000020834        003323212
      4:000020999        003212100
      5:000021101        003121010
      6:000080428        000101916
      I:000132000        017210000
```

3a. Outlets →

3b. Inlet →
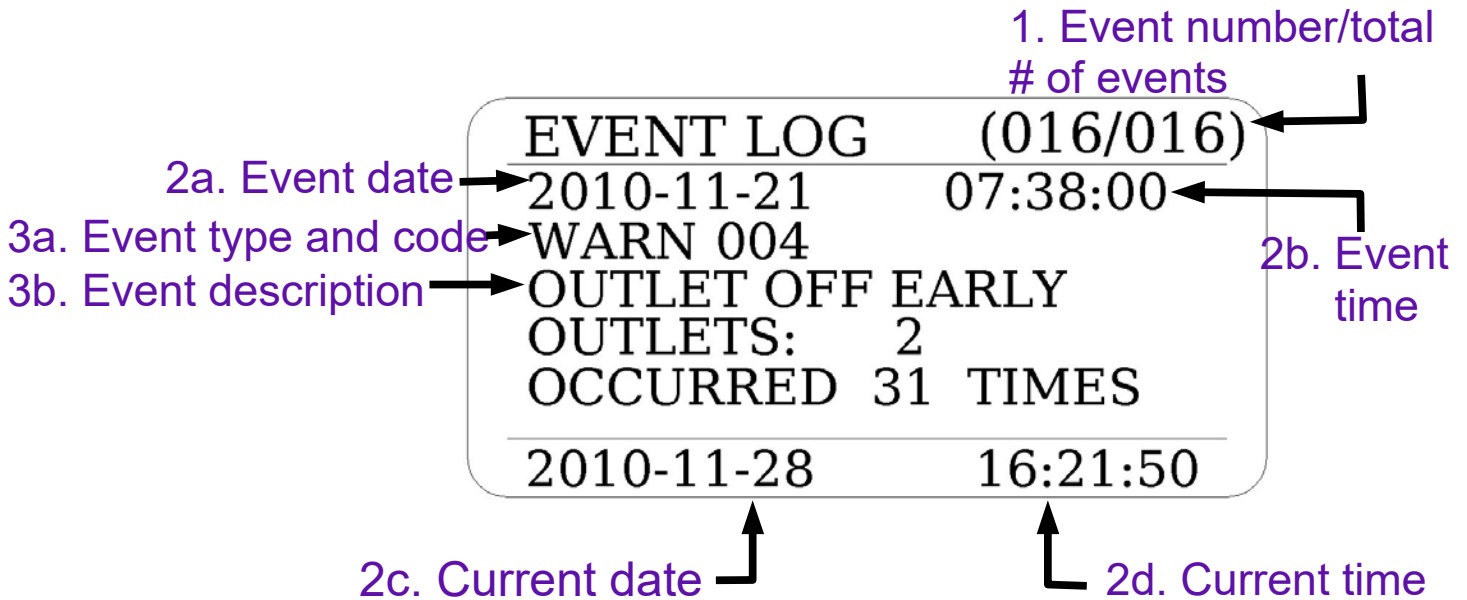
Keypad functions

UP/DOWN:	Cycle between categories
PAGE:	Go to next screen

---

1. Category: The type of counts that are displayed. Use the UP/DOWN to cycle between the different Categories:
   [TIME]   (Number of seconds spent dosing),
   [COUNT]   (Number of times each outlet has dosed), and
   [AVERAGE] (Average duration of each dose; TIME divided by COUNT)

2a. Period time: (Resettable)   The counts for each outlet/inlet since the IVM was last re-set.

2b. Total time: (Non-Resettable)   The counts for each outlet/inlet for the life of the valve (monitor).

3a. Outlets: Each outlet has its own resettable Period and Total counters.

3b. Inlets: TIME and COUNTS for the valve inlet (top of the stem in the RDSA) are also logged. This can be used for cross-checking correct operation. If the system and valve are functioning properly, the inlet count should be close to the sum of the outlet counts. Some variation will occur due to the time for the flow to reach the valve and cause the RDSA to "seat". Inlet time should also be very similar to the time logged by the pump dosing the valve (eg. Compare to the elapsed time meter - ETM data for the pump).

Also note, the IVM "inlet sensor" logs time when the IVM is powered up but not installed on the valve.

EVENT LOG Page

1. Event number/total # of events

2a. Event date →

3a. Event type and code →
3b. Event description →

```
EVENT LOG      (016/016)
2010-11-21        07:38:00
WARN 004
OUTLET OFF EARLY
OUTLETS:      2
OCCURRED  31  TIMES
2010-11-28        16:21:50
```

2b. Event time

2c. Current date

2d. Current time

Keypad functions

UP/DOWN:	Cycle through stored events.
PAGE:	Go to the next screen.

1.	Event number/total # of events:	The current event number, and the total number of events that have been stored. Pressing the UP/DOWN buttons will cycle through events.
2a.	Event date:	The date that the event occurred. In the case of the same event occurring more than once, this is the date of the first occurrence.
2b.	Event time:	The time that the event occurred. In the case of the same event occurring more than once, this is the time of the first occurrence.
2c.	Current date:	The current date.
2d.	Current time:	The current time.
3a.	Event type and code:	Indicates the event type (Warning, Info, or Error/Alarm), and the event code. For a complete list of event codes, refer to Table 1 in the Appendix of this guide.
3b.	Event description:	Description of the event. In this example, the outlet was on for less than the minimum required on-time.

EVENT LOG Page (cont'd)

```
EVENT LOG      (016/016)
2010-11-21        07:38:00
WARN 004
OUTLET OFF EARLY
OUTLETS:     2
OCCURRED  31  TIMES
2010-11-28        16:21:50
```
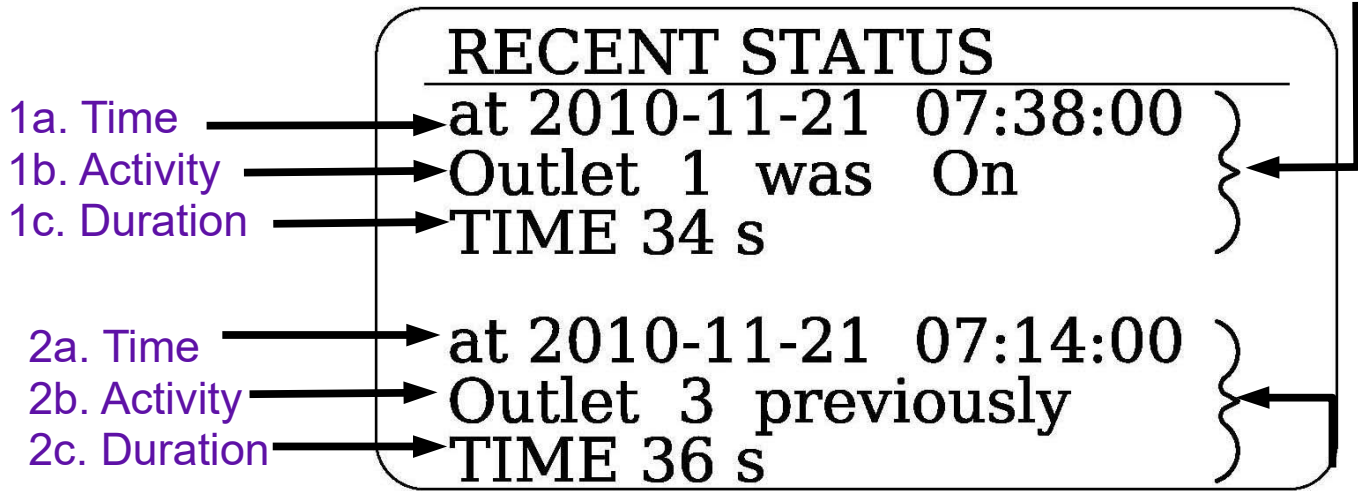
4. Outlets ⟶
5. Number of
    occurrences ⟶

Keypad functions
    UP/DOWN: Cycle through stored events.
    PAGE: Go to the next screen.

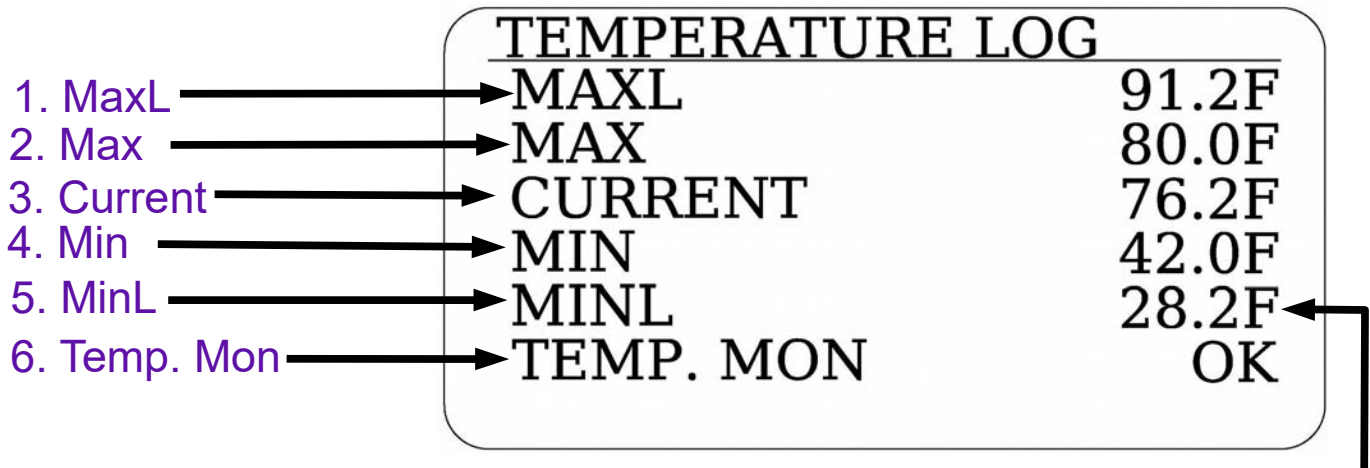|		
4.	Outlets:	The outlets which have been affected by the event. In this example, outlet 2 turned off too early.
5.	Number of occurrences:	The number of times this event has occurred consecutively. In this example there have been 31 consecutive instances where either outlet 2 has been off too early. Note that if a different error or warning event occurs, a new entry is made and a new count is started.

RECENT STATUS Page

```
RECENT STATUS
at 2010-11-21  07:38:00
Outlet  1  was   On
TIME 34 s

at 2010-11-21  07:14:00
Outlet  3  previously
TIME 36 s
```

1a. Time

1b. Activity

1c. Duration

2a. Time

2b. Activity

2c. Duration

2. Previous activity

Keypad functions
PAGE: Go to next screen

1.	Most recent activity:	The **most** recent active outlet.
1a.	Time:	The date and time that the outlet was active.
1b.	Activity:	Which outlet was active. If the outlet is currently on, this will read "*Outlet is On*". Otherwise this will read "*Outlet was On*".
1c.	Duration:	The length of time that the outlet was active.
2.	Previous activity:	The **second** most recent active outlet.
2a.	Time:	The date and time that the outlet was active.
2b.	Activity:	Which outlet was active.
2c.	Duration:	The length of time that the outlet was active.

TEMPERATURE LOG Page

```
TEMPERATURE LOG
```

1. MaxL	→ MAXL	91.2F
2. Max	→ MAX	80.0F
3. Current	→ CURRENT	76.2F
4. Min	→ MIN	42.0F
5. MinL	→ MINL	28.2F ←
6. Temp. Mon	→ TEMP. MON	OK

Units of measure can be changed from °C to °F in TEMP. SETTINGS of ADMIN.MENU

Keypad functions
PAGE: Go to next screen

1. MaxL: Maximum Lifetime.
2. Max: Maximum temperature since reset.
3. Current: The temperature now.
4. Min: Minimum temperature since reset.
5. MinL: Minimum Lifetime.
6. Temp. mon: Confirms Temperature Monitoring as installed and functioning.
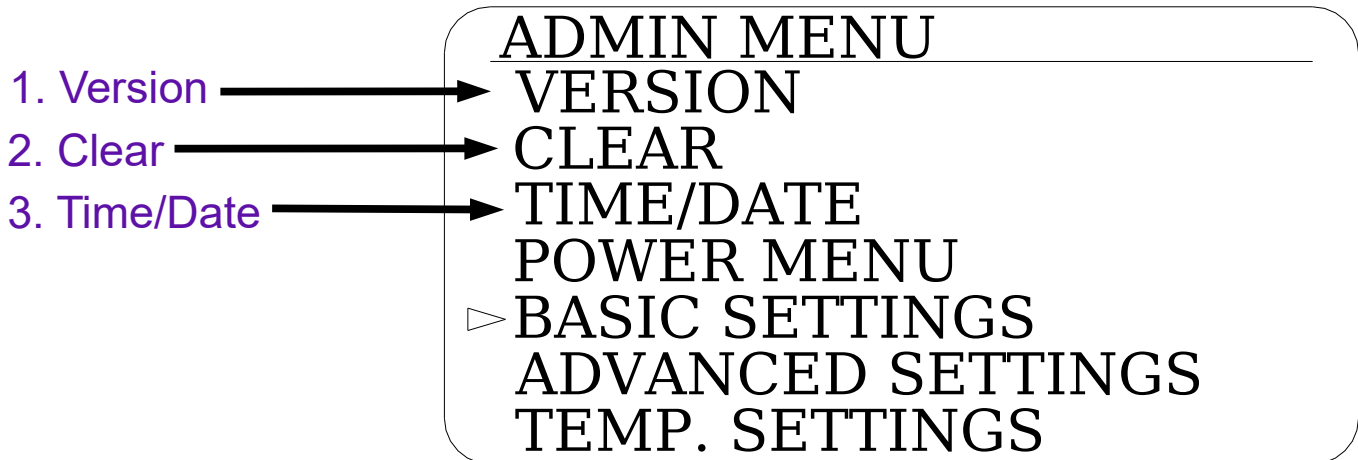
The temperature is monitored at the top of the indexing valve (under the top cover of the IVM).

An upper and lower *warning* temperature and an upper and lower *alarm* temperature can be set at the discretion of the system operator. This can be helpful to alert maintenance personnel of potential extreme temperature conditions which may have a negative impact on the operation of the valve or sewage treatment system performance. The minimum and maximum temperature values which will register a warning or trigger an alarm may be set in the ADMIN. MENU/TEMP.SETTINGS sub-menu.

MIN and MAX values will be reset if the IVM is cleared. The IVM will take approximately one minute to display correct MIN and MAX values after being cleared.

The MINL and MAXL are kept for the lifetime of the IVM and are not resettable under normal circumstances.
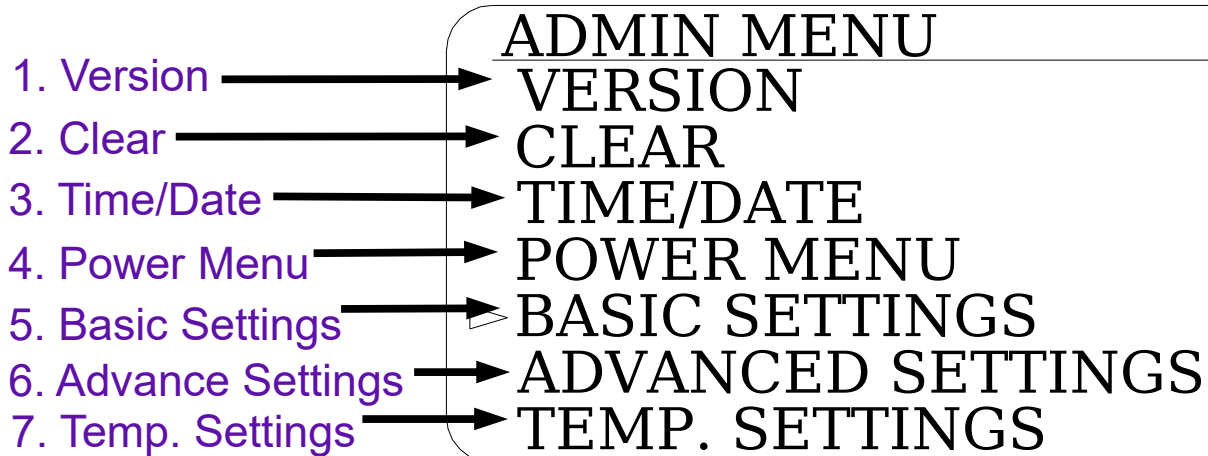
ADMIN. MENU Page

1. Version →

2. Clear →

3. Time/Date →

```
            ADMIN MENU
            VERSION
            CLEAR
            TIME/DATE
            POWER MENU
          ▷ BASIC SETTINGS
            ADVANCED SETTINGS
            TEMP. SETTINGS
```

Keypad functions

UP/DOWN:	Menu item
OK:	Select menu item
PAGE:	Go to next screen

---

1. Version: Displays the current version information.

2. Clear: This clears the period counts and minimum and maximum temperature logged. To clear, highlight the Clear item. Then press the OK button. "<u>OK</u>" will appear, then press the OK button again and this will confirm the clear – *RESET* will appear briefly on the screen and then disappear.

The period counts can be used as a resettable counter similar to a "trip meter" in a car. Note: The TOTAL counts will never reset, similar to an odometer in a car.

3. Time/Date: Allows you to set the current time and date.

Note: The time is set using **24 hour clock format**. Daylight savings time is not supported.
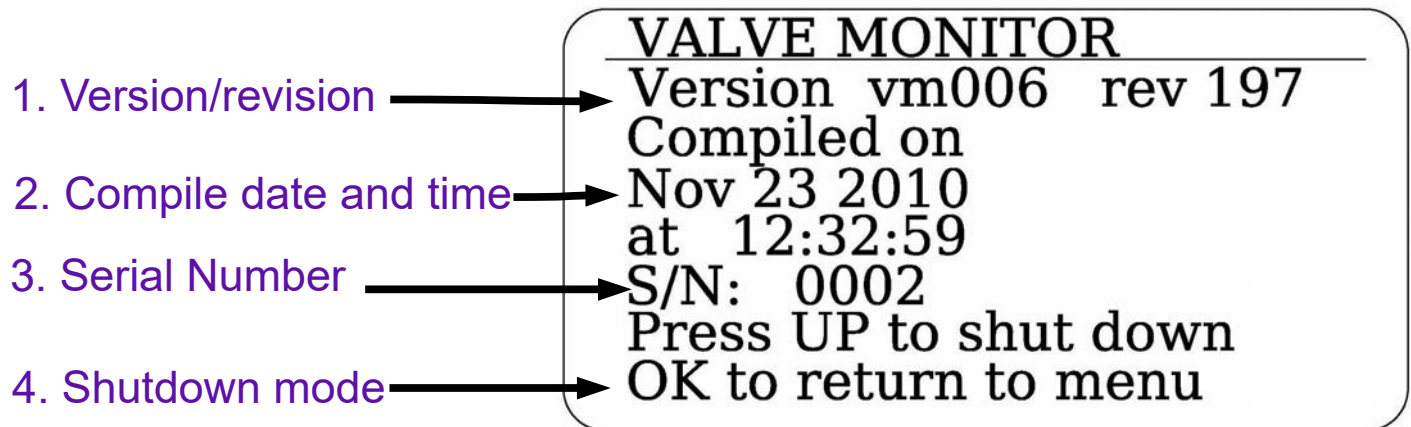
ADMIN. MENU Page (cont'd)

1. Version ———————→ ADMIN MENU
2. Clear ———————→ VERSION
3. Time/Date ——————→ CLEAR
4. Power Menu ——————→ TIME/DATE
5. Basic Settings —————→ POWER MENU
6. Advance Settings ————→ BASIC SETTINGS
7. Temp. Settings ————→ ADVANCED SETTINGS
                                              TEMP. SETTINGS

Keypad functions

UP/DOWN:	Menu item	
OK:	Select menu item	
PAGE:	Go to next screen	

4. Power Menu: Allows setting parameters related to power saving modes, LCD backlight, display automatic power off time, etc.

5. Basic Settings: Allows setting the basic configurations necessary to use the IVM with a valve. Refer to Quick Start Step 5 of this guide for an explanation of the basic settings.

6. Advance Settings: Allows more advanced configurations such as: minimum time for the RDSA to seat, minimum (outlet) on time, maximum (outlet) on time.

The alarm relay configuration can also be changed from normally open (N-O) to normally closed (N-C).

7. Temp. Settings: This will bring you to a new screen that will allow you to set minimum and maximum temperature values for temperature warnings and alarms.

ADMIN.MENU / VERSION Sub-menu

1. Version/revision

2. Compile date and time

3. Serial Number

4. Shutdown mode

```
VALVE MONITOR
Version vm006 rev 197
Compiled on
Nov 23 2010
at 12:32:59
S/N:  0002
Press UP to shut down
OK to return to menu
```

Keypad functions
UP: Shutdown the unit
OK: Return to ADMIN. MENU

The VERSION sub-menu is accessed from the ADMIN MENU.

1. Version/revision   Displays IVM6000 firmware version and revision number.

2. Compile date and   The date and time that the IVM6000 firmware was compiled.
    time:

3. Serial number: Displays IVM6000 serial number.

4. Shutdown mode: Turns the unit completely off. Nothing is monitored or logged.The unit can
                         be shut down by pressing the UP button while in this sub-menu.

                         This may be useful to avoid logging false errors during sewage system
                         start-up or maintainance.

                         To wake the unit from shut down, hold the OK button until the LCD turns
                         on (approximately 5 seconds).

ADMIN.MENU / POWER Sub-menu
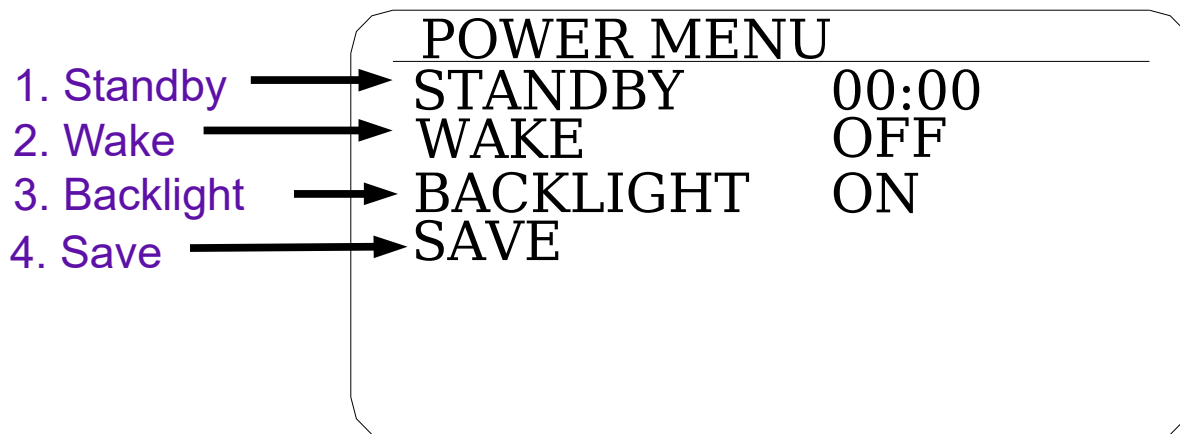
```
            POWER MENU
1. Standby  ──────▶ STANDBY      00:00
2. Wake     ──────▶ WAKE         OFF
3. Backlight ─────▶ BACKLIGHT    ON
4. Save     ──────▶ SAVE
```

Keypad functions

UP/DOWN:	Change value/menu item
OK:	Confirm value/Select menu item
PAGE:	Go to next screen

The POWER sub-menu is accessed from the ADMIN MENU.

1. Standby: This sets the amount of time to wait before going into "Standby mode". When in standby, all essential functions are running, but the LCD display is switched off to conserve power and LCD longevity. Default value is 30 seconds (00:30).

   In this example (with Standby set equal to 00:00), the IVM will never enter standby mode and the LCD display will stay on all the time. To wake from standby, press any button.

2. Wake: If this is set to YES, the unit will wake up from Standby mode and turn on the LCD if there is any activity on the valve. *This can be useful when at site watching for valve activity.*

   NOTE: Wake mode will turn itself off after 30 minutes of use.

3. Backlight: Choose from: "OFF" "MED" "ON". This sets the LCD display backlight brightness. The backlight illuminates the screen for easier viewing.

4. Save: Save the current configuration after making changes.

Select "SAVE" then "OK" , twice, after making any changes.
saved will appear briefly on the screen to confirm your changes are saved.

Table 1: IVM6000 Reference Table of Alarm and Event Codes and their Interpretation.

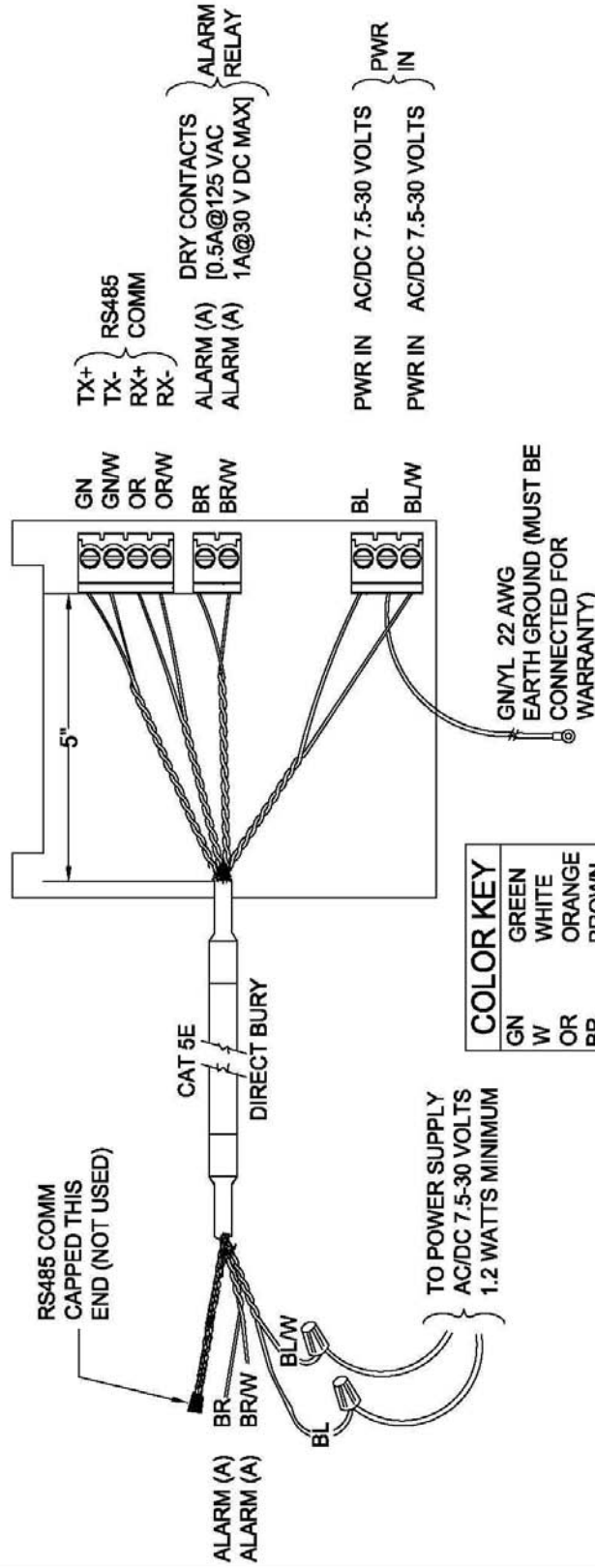| Event Code	Event Description	Interpretation and Troubleshooting Suggestions
0	ALARM CLEARED	Alarm was cleared by user.
1	ALARM TEST	Alarm test button was pressed by user.
2	OUTLET NO INLET	The valve RDSA may not have returned to the fully up position when the water flow stopped. Check valve for debris or broken stem spring.
3	OUTLET ON TOO LONG	The user settable "maximum dose time" pre-set value was exceeded – could indicate problem with pump controls or persistent high level in pump tank. Could also be caused by debris inside the valve preventing the RDSA from returning to its up position when the flow stops.
4	OUTLET OFF EARLY	May not be a problem. The "minimum dose time" pre-set was not met – indicates potential short-cycling of the pump.
5	TOO MANY OUTLETS	Indicates possible electronic malfunction. Consult manufacturer.
6	INLET NO OUTLET	Ensure sensor enabled RDSA is installed and IVM is installed all the way down over valve. Could also be caused by inadequate flow rate or debris in valve in which case valve RDSA may not be fully seated in the down position over one outlet. This will allow water to flow to all the zones at the same time.
7	OUT OF SEQUENCE	Based on the valve model selected in the "Basic Settings" menu page, outlets were not activated in proper order. Ensure monitor is set up for correct valve model and that the correct cam is being used. Valve could be short cycling. Check for siphoning between pump doses or air pockets.
8	PCT DEV EXCEEDED	The user settable "allowable variation" in relative distribution among outlets has been exceeded – uneven distribution has occurred.
9	DEVICE RESET	IVM was reset manually or the power was totally lost.
10		INTERNAL USE
11	OUTLET IS STUCK	Valve does not cycle to the next outlet – water is flowing from the same outlet every time – cam or stem spring could be broken.
12	LOW VOLTAGE	Potential partial loss of power (Low battery).
13	VOLTAGE RECOVERED	The voltage returned to the valid range.
14	CAM/VALVE MISMATCH	Based on the valve model selected in the "Basic Settings" menu page, an unexpected outlet was activated. Ensure monitor is set up for correct valve model and that the correct cam is being used. Check valve cam or RDSA for damage.
15		INTERNAL USE
16	RTC_BATTERY_LOW	The battery for the Real Time Clock is low – IVM may not keep correct time and/or date if line power is lost.
17	RTC_FAIL	The battery for the Real Time Clock is dead – IVM will not keep correct time and/or date if line power is lost.
18	COUNTERS CLEARED	Logs for inlet/outlet counters and events were cleared by user.
19	TEMPERATURE WARN	The user settable "minimum or maximum warning temperature" was exceeded.
20	TEMPERATURE ALARM	The user settable "minimum or maximum alarm temperature" was exceeded.

Note: RDSA = Rubber disk and stem assembly (located inside the valve).

Table 2: IVM6000 Reference table of alarm sensitivity level settings.

Event Code	Event Name	Number of times event has to occur for alarm to be triggered		
		Low	Medium	High
0	EVENT_NO_EVENT	0	0	0
1	EVENT_TEST	1	1	1
2	EVENT_OUTLET_NO_INLET	254	1	1
3	EVENT_OUTLET_ON_TOO_LONG	254	1	1
4	EVENT_OUTLET_OFF_TOO_SOON	0	16	1
5	EVENT_TOO_MANY_OUTLETS	254	1	1
6	EVENT_INLET_NO_OUTLET	0	0	1
7	EVENT_OUT_OF_ORDER	254	8	1
8	EVENT_PCT_DEVIATION	1	1	1
9	EVENT_RESET	0	0	1
10	ETC INTERNAL USE	-	-	-
11	EVENT_OUTLET_STUCK	254	16	1
12	EVENT_VOLTAGE_LOW	1	1	1
13	EVENT_VOLTAGE_OK	0	0	1
14	EVENT_INAPPROPRIATE_OUTLET	1	1	1
15	ETC INTERNAL USE	-	-	-
16	EVENT_RTC_BATTERY_LOW	1	1	1
17	EVENT_RTC_OSCF	1	1	1
18	EVENT_CNT_CLEAR	0	0	1
19	EVENT_THERMO_WARN	254	16	1
20	EVENT_THERMO_ALARM	1	1	1

*Note: "0" value means that the event will never trigger and alarm at that sensitivity level.

IVM WIRING COMPARTMENT

5"

CAT 5E

DIRECT BURY

GN
GN/W
OR
OR/W

BR
BR/W

BL
BL/W

TX+ } RS485
TX- } COMM
RX+
RX-

ALARM (A) } DRY CONTACTS
ALARM (A) } [0.5A@125 VAC
            } 1A@30 V DC MAX] } ALARM RELAY

PWR IN   AC/DC 7.5-30 VOLTS } PWR
PWR IN   AC/DC 7.5-30 VOLTS } IN

GN/YL 22 AWG
EARTH GROUND (MUST BE
CONNECTED FOR
WARRANTY)

COLOR KEY
GN   GREEN
W   WHITE
OR   ORANGE
BR   BROWN
BL   BLUE
YL   YELLOW

RS485 COMM
CAPPED THIS
END (NOT USED)

BL/W
BR
BR/W
BL

ALARM (A)
ALARM (A)

TO POWER SUPPLY
AC/DC 7.5-30 VOLTS
1.2 WATTS MINIMUM

NOTE:
All entry and exit wiring through alarm
panel and wiring compartment cover to
feed through cable glands.

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MONITORS.COM

PROJECT:

TITLE   IVM 6000
             IVM Wiring Diagram

SCALE   NTS   FILE IVM-C2-121   CHK IAG   DRAWN BY CEM

JOB NO   IVM

DATE July 8, 2014   REV. NO.

IVM6000-LP™ WARRANTY

THIS IVM6000™ IS WARRANTED TO BE FREE FROM DEFECTS IN MATERIALS OR WORKMANSHIP FOR ONE YEAR FROM THE DATE OF PURCHASE. WITHIN THIS PERIOD, ENGINEERING TECHNOLOGIES CANADA LTD. (dba DYNAMIC MONITORS) WILL, AT ITS SOLE OPTION, REPAIR OR REPLACE ANY COMPONENTS WHICH FAIL IN NORMAL USE. SUCH REPAIRS OR REPLACEMENT WILL BE MADE AT NO CHARGE TO THE CUSTOMER FOR PARTS OR LABOR, PROVIDED THAT THE CUSTOMER SHALL BE RESPONSIBLE FOR ANY SHIPPING COST. WARRANTY DOES NOT APPLY TO ANY PRODUCT THE EXTERIOR OF WHICH HAS BEEN DAMAGED OR DEFACED, OR PRODUCT WHICH HAS BEEN SUBJECTED TO IMPROPER VOLTAGE OR OTHER MISUSE, ABNORMAL SERVICE OR HANDLING, OR WHICH HAS BEEN ALTERED OR MODIFIED IN DESIGN OR CONSTRUCTION.

PROOF THAT AN EARTH GROUND WAS USED IN THE INSTALLATION MUST BE PROVIDED FOR WARRANTY COVERAGE.

NOTE: REPAIRS HAVE A 90 DAY WARRANTY. IF THE UNIT SENT IS STILL UNDER ITS ORIGINAL WARRANTY, THEN THE NEW WARRANTY IS 90 DAYS OR TO THE END OF THE ORIGINAL ONE YEAR WARRANTY, DEPENDING UPON WHICH IS LONGER.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY IN DIFFERENT JURISDICTIONS.

IN NO EVENT SHALL DYNAMIC MONITORS OR ENGINEERING TECHNOLOGIES CANADA LTD. BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

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IMPORTANT: A RETURNED MATERIALS AUTHORIZATION (RMA) MUST FIRST BE ISSUED PRIOR TO SENDING A UNIT IN FOR WARRANTLY WORK. DO NOT SHIP UNITS WITHOUT FIRST OBTAINING A VALID RMA OTHERWISE YOUR SHIPMENT WILL NOT BE ACCEPTED.

PROOF OF PURCHASE WILL BE NECESSARY FOR ANY WARRANTY CLAIMS.

Where to obtain service: **Dynamic Monitors**
16 Myrtle St., Unit #1
Stratford, PE Canada   C1B 2W2

TOLL FREE 888-747-7645
**DIRECT (902) 628-1705**

DynamicMonitors.com

# INTELLIGENT VALVE MONITOR™
for reliable designs and peace of mind™

IVM6000™-LP Line Powered Version
Works with all third party 6000 series distributing valves

Easy to install & retrofit:
- 10 minute install or retrofit over valve
- No modifications to inlet or outlet piping
- No extra sensors required

100% detection of uneven distribution caused by:
- Debris inside valve
- Broken stem spring
- Inadequate flow to seat disk
- Faulty installation
- Flow interruptions, air pockets
- Pump/control panel problems
- Wrong cam or broken cam
- Siphoning through valve
- Back pressure on valve
- Freezing of valve or piping

Unexpected, undetected distributing valve malfunctions can cause significant risk and costly problems for system designers, operators and owners. System overloading, environmental contamination, permit violation, and the associated costly repairs can all be caused by valve problems. Preventing such emergency situations has traditionally required frequent site visits and inspections, however this increases Operation & Maintenance costs.

Introducing the first electronic monitor and early-warning alert system for all major third party 6000 series mechanical distributing valves by K-Rain®, Orenco®, Zoeller® and others.

The IVM6000™-LP Intelligent Valve Monitor™ ensures reliable designs and peace of mind, by confirming even distribution to all zones, as well as providing early detection and immediate alert of valve malfunctions.

Simply replace the valve's original rubber disk and stem assembly with the sensor enabled one supplied with the IVM6000™. Slide the monitor down over the valve and supply low voltage line power. Connect the dry contact alarm output to any standard third party pump control panel and the IVM6000™-LP is ready to provide immediate notification of any valve malfunctions.

The distributing valve + Intelligent Valve Monitor™ combination offers superior reliability and control system simplicity compared to using solenoid or motor-actuated valves for zoning effluent distribution systems. It is also much less costly than using larger pumps, or many additional pumps which increases control panel complexity.

"The monitors provide peace of mind that the valves are distributing effluent uniformly, and have significantly reduced the amount of time I spend making random spot checks. Your IVMs are one of the most useful, time saving devices I have seen in a very long time, maybe ever!"

Art Betker, Class C WWT Operator
Rice, Minnesota

DYNAMIC MONITORS.COM

Toll free 1-888-747-7645
Direct   1-902-628-1705
IVM@DynamicMonitors.com

Valve operation is tracked and real-time status of relative distribution is provided on the LCD display.

```
1: 17%
2: 27%
3: 16%
4: 17%
5: 33%

ERR 008
```
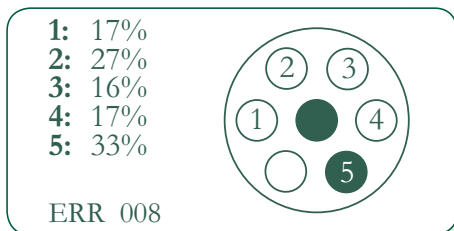
6605 – Outlet 5 active, status ALARM

```
1: 26%
2: 24%
3: 25%
4: 25%

OK 000
```
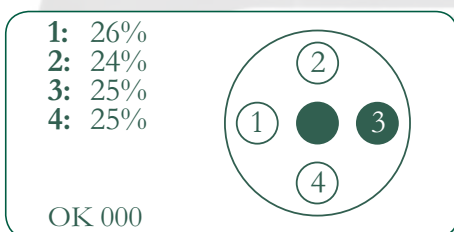
6404 – Outlet 3 active, status OK

Alarm Event	Description / Explanation
Percent Deviation Exceeded	Uneven distribution has occurred.
Inlet No Outlet	RDSA is not fully seating in "down" position. Water is flowing out of all outlets at the same time.
Outlet No Inlet	RDSA may not be returning to the fully "up" position. Check for broken stem spring or debris.
Outlet is Stuck	Valve does not cycle to next outlet.
Cam Mismatch	Incorrect or damaged valve cam.
Out of Sequence	Outlets were not activated in correct order.
Outlet on Too Long	Maximum pump dose time pre-set value exceeded.
Outlet off Too Early	Minimum pump dose time pre-set value not met.
Temperature Alarm	Below minimum or exceeded maximum temperature value.
Device Reset	Possible power failure

Product Specifications

Valve/Cam Model:	All 6000 series. 2, 3, 4, 5 or 6 outlets.
Line power:	Any from 7.5~ 30V AC or DC.
Power consumption:	<50mA @ 24V AC, <1.2Watts max
Alarm output:	Relay contact ratings 1A/30V DC max, 0.5A/125V AC max.
Event Storage:	Records all events with 255+ repeat counts on each entry.
Dimensions:	9.5" x 8.5" x 7.5" (high) (240mm x 216mm x 191mm)
Shipping Dimensions:	10" x 10" x 10" box
Cable:	24 AWG 4/8 Conductor, Direct bury, 10 ft (3.0m) standard
Weight:	approx. 2 lbs 15 oz (1325g)
Materials:	Case ABS, Lens: Polycarbonate
Measurement resolution:	1 second
Operating Temperature:	-20°C to 50°C (-4°F to 122°F)
Storage Temperature:	-40°C to 80°C (-40°F to 176°F)

Other user adjustable parameters:

- Allowable outlet percent variation
- Valve model/cam
- Alarm error sensitivity (Low, Medium, High)
- Minimum, maximum (pump dose) on time
- Minimum, maximum alarm temperatures
- Date and time
- Lifetime and resettable counters/timers
- LCD backlight

Installation:

Slides down over top of valve. Replace original rubber disk and stem assembly (RDSA) with sensor-enabled RDSA supplied with monitor.

IVM RDSA
(dark blue stem)

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U.S. Patent No. 7,735,509. Canadian Patent Pending