

Technical Specifications

M342

Web-to-Wireless
Remote Monitor and Control System



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M2M M342 Base Configuration

The M342 is designed for high-voltage load control and monitoring; primarily irrigation pumps with 250hp or larger. Voltages for other applications can be set using the included jumper.

Additional uses of the M342 include, but are not limited to:

- Farm management including soil moisture, temperature, and humidity monitoring.
- Security system control and monitoring to protect cables and equipment from theft.

Our new / Site Server Systems offer the following features:

- Increased reliability
 - High-durability hardware
 - Robust cellular and satellite communications, including advanced retries and intelligence and performance tests
- Additional I/O options
- Increased wireless capabilities
- Supervised Control Technology (SCT)
 - Downloadable control schedules for enhanced time clock functionality
 - Accurate real-time clock



Operation is simple

1. Connect the M342 to the device(s) you want to monitor and turn it on. Set up the values the device will record and send.
2. The M342 will automatically establish two-way communication over the communications network to the M2M Web site.
3. Log into the secure/branded M2M portal to:
 - View the last reported status of your equipment including switch positions, equipment on/off status, tank levels, number of pump starts, and run time.
 - Request an updated report from the device.

Three Digital Inputs

The M342 is equipped with three on-board digital status inputs. One input is a high voltage input for 480VAC pump On/Off status monitoring. The other two are opto-isolated dry contact inputs for additional status monitoring, such as KYZ meter pulse counting.

You can select to individually enable or disable each input and configure the inputs to either report or not report all state changes.

The M342 reports the state of all inputs when any input changes states in either direction (open-closed or closed-open) for longer than the set trigger time. The trigger time of each input is set either by the on-site installer or through the M2M Web site. Trigger times can vary from 1-240 seconds. Additionally, the M342 ignores any change to an input that does not last for the specified time. The default trigger time is five seconds.



Surge suppression circuitry per ANSI IEC 61000-4-2, 61000-4-4, and 61000-4-5 protects the input to minimize the effect of external transient voltages.

Four Analog Inputs

Four hard-wired analog inputs can be set to monitor either 4-20 milliamp (mA) or 0-10VDC sensors. These inputs provide the capability to locally connect to sensors, such as pressure (before and after sand filters), flow, pump current or other sensors. Additionally, the M342 can be configured using remote radios to monitor up to 12 remote (wireless) sensors.

Two programmable set points and one trigger time are locally programmable for each analog input or set through the M2M Web site. When the monitored signal crosses a set point for the specified trigger timer, a range change report sends. The A-D converter has 10-bit resolution, so the analog report sends the measured signal(s) as a number from 0-1023.

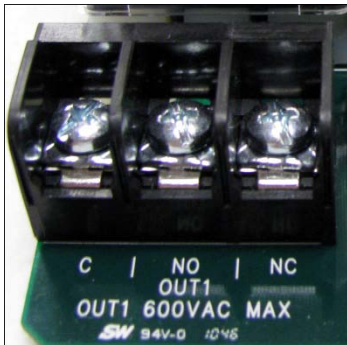
The M2M Network Operations Center (NOC) converts the raw numbers into meaningful values such as temperature, tank level, pressure, etc. These flexible conversion options allow the system to monitor and accurately interpret many types of sensors. The analog report also includes the present range (low, medium, high) of the monitored signal.

Surge suppression circuitry per ANSI IEC 61000-4-2, 61000-4-4, and 61000-4-5 protects the analog inputs.

External Power Supply

As a convenient power source for low powered sensors, the M342 provides 12 and 24VDC at 100mA.

Two Remote Control Outputs



The M342 includes one 480VAC-rated control relay. The relay connects to either the Normally Open (NO) or the Normally Closed (NC) contact point on a terminal strip.

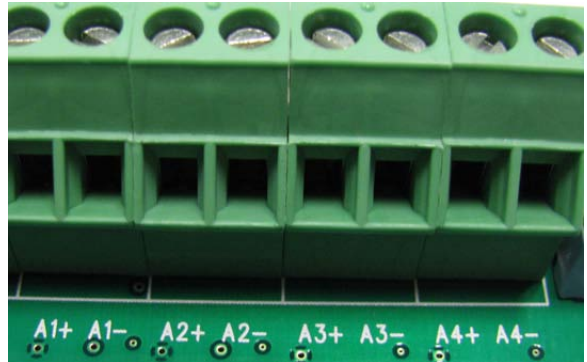
- Remote commands from the Web server can:
- Set each output to a steady state ON or OFF.
 - Initiate a temporary ON or OFF condition.

An additional 8-Amp-240VAC relay is included for miscellaneous additional controls.



Long Distance Machine-to-Machine Controls

The M2M Network Operations Center can be used to forward control commands from one device to another — anywhere in the world. Control commands can be sent to any M2M device based on input conditions reported by another device.



Integrated Power Supply and Battery Backup - for Power Outage Reporting

The standard M342 operates from 240 VAC. The circuit board includes an on-board voltage regulator that is used to continually charge an 8.0 Amp Hr, 12VDC battery while AC power is present.

If the AC power is lost for more than one minute, the unit will report the power outage. When power is restored, a Power On call will be made.

DC powered units are also available as a factory option.

A15VDC supply is required if the backup battery is to be used. Otherwise, 12VDC can be used. A special low power mode can be enabled to reduce the unit's power consumption. In this mode, the radio is powered down except when a report is being transmitted. This is useful for solar powered applications where no controls or reports are needed.

Reporting Options

Reports are triggered for three reasons:

- A specified alarm condition occurs such as a specified digital input or analog range change
- A time-scheduled report is due
- A report is requested from the Web site

The status of the connected inputs and outputs are reported along with a variety of system configuration information. Reports can be time scheduled at a programmable frequency, from once every hour to once every 240 hours (10 days).

The reports can be requested at any time from the Web site.

Daily Transmission Limits

To reduce the number of transmissions that might result from over-active inputs or power cycling conditions, the number of event-based calls per 24 hours can be limited. Time scheduled calls and user requested status calls continue to send even after reaching this limit. The daily limit can be set from 1 to 225. The default setting is 150 calls for data logging devices, 20 for non-data logging devices.

Multiple Communication Options

A choice of cellular or satellite based communications provides coverage anywhere in the world. Currently, the M342 uses CDMA or GSM networks through carriers such as Verizon Wireless or T-Mobile. For remote areas where there is no cellular coverage, the M342 uses the Iridium Satellite network.

Easy Installation and Test

A push-button switch initiates a test in which LEDs are used to indicate the signal strength being received by the radio. This is used to facilitate installation, antenna selection and orientation, and troubleshooting.

In addition, informative status messages and test functions can be displayed to a computer or Palm terminal program to help understand what the system is doing and to aid in troubleshooting.

Over-The-Air Updates

The M342 system receives over-the-air updates for the following:

- M2M firmware (operating system)
- M2M operational parameter configurations
- Cellular modem configurations (CDMA only)

Supervised Control Technology (SCT)

The Supervised Control Technology (SCT) supports remote time scheduling of critical controls. Using SCT, you can:

- Automate equipment operations to avoid peak pricing times.
- Create flexible time / date scheduled command sequences including repetitive “until cancelled” events.
- Receive immediate notification of any control failures.

Each M342 includes an internal real time clock. The clock's accuracy is maintained by the M2M NOC. Control schedules are downloaded in advance to the M342 to ensure that operations are carried out even with a temporary communication problem. Additionally, control schedules can be set for one-time or to repeat until cancelled. You can also set the M342 to report to the M2M NOC approximately one hour before each scheduled control action.

The M2M NOC monitors all scheduled controlled actions. If the M342 does not report as scheduled, the NOC notifies both M2M and the customer notification list by a phone call, email, and/or text messages.

Advanced Remote Network Sensor Capabilities

Connecting remote radios to the M342 expands its monitoring capabilities. The remote radios support a variety of sensors including multi-depth soil moisture probes, temperature / humidity, flow meters, and many more. The remote network radios can communicate with the M342 up to a mile away with line-of-sight placement.

Data Logging and Charting

The M342 can collect data through its inputs from a variety of sensors. You can decide when the device sends that data to the M2M NOC through regularly scheduled reports. The NOC averages and stores your data in 15, 30, or 60-minute intervals. Using the M2M Web site, you can create custom charts that display the values recorded from the inputs as easy-to-understand graphs that show the most recent data or historical trends — you decide.

Using the data logging option allows you to adjust your operations to meet your unique needs. For instance, if you are concerned about soil moisture levels and over- or under-watering, you can place several soil moisture sensors and monitor the soil saturation levels. You can then decide to water more or water less depending upon what you decide is the ideal saturation point.

WWW.M2MCOMM.COM

At the M2M Communications Network Operations Center, incoming data is validated and processed for distribution to the end user. In addition, configuration and control information can be sent from the M2M Web site to the M342.

The central Web server records and displays all incoming status messages and depending on the customer's instructions can notify the customer of the event via e-mail or telephone (using a text-to-speech voice message), and/or pass the data to the customer's designated e-mail or IP address.

After entering a unique user ID and password:

- Current and historical data can be viewed for the M342. Displays can be personalized with informative labels and units.
- Data exporting options can be defined.
- Remote control commands, reporting options and user notification messages can be created and maintained.
- Time scheduled reports and commands can be defined.

- Status reports can be requested.
- Time/date scheduled command sequences can be set up

M2M customers can also dial in to the toll-free number of the automated M2M Network Operations Center to hear a spoken status report of their monitored equipment or facility from any telephone in North America. The text-to-speech based status message may be as complex as a listing of all monitored inputs and outputs or it may be as simple as “the pump is off.” You can also send remote control commands directly from the telephone.

User Notifications

Digital input changes and analog range changes can be used to trigger notifications to a list of contact people. Notifications include telephone based voice (text-to-speech), emails, and/or text messages. The call-out lists, messages, and triggers are fully definable by the user.

Additional Features

- Stand-alone Real Time Clock (on-board) synced to the M2M NOC
- Additional on-board EEPROM
- Alternative assembly as a low-voltage M242 for general purpose usage
- Advanced scheduling for dispatch / control commands
 - Example: Turn off at 2:00 PM on Tuesday for 240 minutes
- Upgraded high-voltage control relay for 480 VAC operation
- Supports up to 12 remote wireless sensors in any arrangement, such as 4x3, 6x2, or 12x1
- Supports single and multi-depth soil moisture probes
- Supports additional types of remote wireless sensors including temperature / frost
- Includes security system logic that can be enabled / disabled

Hardware Specifications

Antennas

The standard cellular antenna mounts inside the enclosure. External high gain antennas are available for remote locations. Satellite antennas are external and must be mounted with a clear view of the sky.

Environmental

A weatherproof polycarbonate enclosure with a hinged, gasketed lid contains the internal components.

Recommended operating temperature	Recommended relative humidity
-22 to 140 degrees F (-30 to 60 C)	5 - 85% non-condensing