

**MastMinder F400 Fuel Management System
GPRS and / or SMS version**



The MastMinder F400 Fuel Management system is a low-cost stand-alone version of the proven MastMinder Fuel Management module derived from the MastMinder M400A complete Site Management system.

It has been designed to be low cost yet fully functional, totally scalable to monitor an almost limitless number of sites focused to one central multi-user operating console.

The system utilizes the minimum remote site hardware together with the standard software from the proven MastMinder NMC multi-user interface.

The system offers the following features –

- Inbuilt web interface using web browser if GPRS configuration or local RS232 communication port for lap-top if SMS only communication.
- Simple pre-configured installation (site type specific builds easily loaded)
- Automatic notification of fuel loss (configurable)
- Automatic notification of fuel fill-up (configurable)
- Automatic notification of Generator Failed to Start on Mains Failure
- Fuel level history graphs
- Fuel fill-up history graphs
- Consumption calculations
- Generator start / stop times
- Generator running hours
- Commercial Mains on load / not on load
- Commercial Mains available hours
- Generator starting battery voltage
- Internal back-up battery to allow notification of power supply disconnection and to continue operation after 12 / 24 volt generator battery disconnected or very low voltage
- Heart-beat signal every 1 hour (configurable) to confirm communications
- Ability for remote reset of generator Common Alarm faults on AMF Panel
- Ability for remote test starting of generator
- Optional automatic periodic exercising of generator if not been used

General remote hardware features –

- All software in remote unit is remotely configurable via the GPRS communication.
- All firmware in remote unit may be “flash” updated via the GPRS communication using MastMinder proprietary technology which will not leave the remote unit “dead” when communication is lost during a flash upgrade.
- Simply install, connect power, system will automatically activate the site on the central NMC server interface and continue to monitor.
- Simple installation, one DIN rail (or surface mounted) unit, one Hydrostatic submersible Fuel Sensor, all connecting cables are simply plug connected, one cable to detect generator running, optional cable to monitor mains contactor plus connection for 12 / 24 volt supply.
- Included is a generic generator interface module to detect "generator running", "generator on load" and "generator failed to take load" and will work on any generator.
- All cables, plugs and leads with flying ends included.
- Completely self-contained.

Remote Access to data from Mobile Phone or tablet –

- System supports mobile phone access using standard SMS communication or a rich mobile interface and local database using the Android platform.
- Only authorized users have access to the system.
- System may be configured as to which users can see which sites and who can perform functions such as remotely test starting a generator for example.
- Interrogate to check current Fuel Level (also see if generator running and if mains contactor is IN or OUT, fault conditions etc.) from any authorized mobile phone
- The Android version will automatically process unsolicited messages from the server in the background and alert the user as necessary
- With the standard SMS version there is only one central number to send SMS enquiry to, regardless of site (specify site name or wild-card name).
- Automatic notification, to selected mobile phones, of Low Fuel Level
- Automatic notification, to selected mobile phones, of Generator Failed to Start

Bonus features –

- Site Call-Out logging for all sites on central NMC server system
- Site Fill-Up logging for all sites on central NMC server system

As a special bonus the central NMC server system database may be configured with an almost limitless number of additional sites that are not equipped with MastMinder remote hardware.

The advantage of this is that the database may then be populated with any number of sites and then take advantage of the MastMinder site Call-Out logging and Fuel Fill-Up recording for all sites in the network.

All data may be kept on-line for any duration, say 10 years.

The central NMC software is a multi-user system and may be accessed by an unlimited number of users on the Local Area Network or remote users with authorized access to the network.

Components required to be supplied by customer.

- GPRS DATA enabled SIM card for unit to connect to network.
- One standard server PC with Windows Server 2008 standard edition or later installed and SQL Server 2008 R2 standard edition or later installed (SQL Server 2014 preferred).

Installation Process.

- Install Fuel Sensor in tank
- Clip MastMinder F400 unit to existing DIN rail or surface mount with self-tapping screws
- Plug cable from Fuel Sensor into MastMinder F400 unit
- Connect cable from MastMinder F400 to the MastMinder Generic Generator Interface Module)
- Connect cable from MastMinder F400 to the MastMinder Generic Mains Interface Module)
- Insert SIM card
- Connect cable from MastMinder F400 to 12 / 24 volt supply
- System will automatically communicate with the central server system and will be tested by the installation engineer responsible in the NMC.
- Installation engineer then checks with NMC engineer to check new site is communicating and verifies fuel levels etc.
- All done, site is now functioning.

Additional NMC procedures.

- A contact list is entered into the system of all names and telephone numbers of authorized personnel allowed to interrogate the system from their mobile phone.
- Each site may have any number of people chosen from the contact list who will receive automatic alerts via SMS text message or Android phone app of critical situations such as the generator failed to start or low fuel for example.

System communications.

- GPRS or GPRS with SMS fall-back or SMS only
- The central server system will bi-directionally communicate with the sites via the GPRS or SMS connection.
- Volume of communications is configurable and would consist of a message being sent in the event of generator starting or stopping, unusual fuel loss, fuel fill-up plus every say 1 hour (configurable) to build a database log profile.

Installation & Support

- MastMinder offers to provide initial on-site training for installation engineers.
- MastMinder offers to provide on-site Project Management for roll-out.
- MastMinder offers to provide site engineer & NMC operating staff training.

Installation procedure and costing guide.

The site kit includes -

- **MastMinder F400 control unit** - DIN rail mountable (or can be surface mounted with self-tapping screws).
- **MastMinder Fuel Sensor** – Inserted through a 21mm diameter or larger hole in the top of the fuel tank, sensor is lowered to bottom of tank.

- **100% Complete cable harness** - Plugs already connected on each end where possible, 3m (optionally longer) cable fuel sensor cable to F400, 1m cable to 12 volt supply with in-line fuse holder & fuse, 1m cable to generic generator interface module, 1m cable to generic mains interface module
- Everything 100% included in the site install kit.

Installation

- We estimate that the average time on site should be around 2-3 hours including testing & commissioning.
- No real technical expertise required, normal basic electronics & engineering.
- Inclusive of all parts, cables etc., 100% complete site kit.
- Shipping costs by air are minimal as units are very small & light.

Specifications

Interfaces

Digital Inputs	8 x Switch, Relay Contact or DC voltage up to 30V, threshold 2V
Relay Output	1 x Single pole change-over, 200VDC, 1A 3 x Single pole N/O, 200VDC, 1A
4-20mA Current Loop	1 x 4-20mA current loop input with 8 bit accuracy (0-255) and loop disconnection indication.
RS232 Serial Ports	1 x RS232 serial port used for local console connection.
Format:	9600bps, 8 data bits, 1 stop bit, no parity
Signals:	TXD, RXD, GND
1-Wire I/O Port	1-Wire compatible interface for sensor connection
RS485 Serial Port	1 x RS485 serial port
+12V Output	1 x 12V filtered supply output for fuel sensor

Mobile Networks

Band	Quad-band 850Mhz, 900Mhz, 1800Mhz or 1900Mhz
RF Power	Class 4 (2W) 900Mhz, Class 1 (1W) 1800Mhz, Class 1 (1W) 1900Mhz.
Antenna	external (fitted) via SMA connector
Compatibility	Fully compatible with all GSM networks.

Functions

Programmable Rules	36 x 160 character user programmable rules which specify actions to be taken as a result of individual or logical combinations of input and output states and system parameter values.
Messages	32 x 160 character user programmable messages. Messages can contain variable (system parameter) data.
Real-time clock	Battery backed real time clock
Output Timers	All outputs can be set on or off indefinitely or for a user programmed pulse time in minutes.
Timers	2 x User programmable minute timers, 2 x User programmable second timers

Electrical

Power	6-30 VDC, 150mA average.
Battery Backup	Internal 30 second battery backup

Environmental

Operating Temperature	-20 - +55oC
Storage Temperature	-40 - +85 oC
Humidity	0-95% non-condensing

Enclosure

Type	DIN rail mounting enclosure
Dimensions	104mm x 85mm x 30mm