SELCO

Engine Controllers

Integrated solutions for control and monitoring of diesel and gas engines

www.selco.com

SELCO

SELCO Engine Control and monitoring

SELCO offers a versatile range of control and monitoring units for diesel and gas engines. The range includes start/stop control units with built-in monitoring of critical engine parameters, as well as separate emergency shut-down units

All units are designed to operate in harsh environmental conditions, furnishing sturdy steel casing, front panels with IP 54 protection and solid connection terminals.

The basic functionality enables control of any type of diesel engine regardless of the application that the engine is used in. Furthermore additional features are included specifically focusing on extended functionality requirements found in marine and offshore applications.

SELCO engine controller units and emergency shut-down units carry type approvals from major marine classification societies.

Engine Start/Stop Controller Units

SELCO Engine controller units are designed for flush mount installation in switch panel doors or directly on the engine. The front panels provide user friendly interfaces with keys for manual test and engine start/stop, as well as clear indication of engine status and alarms.

The M2000 is the basic unit for control of conventional diesel engines. It has a front panel design with LED indication and corresponding description of alarms and engine status.

The M2500 unit is the advanced unit with extended functionality enabling control and monitoring of both conventional engines and newer common rail type of engines.

The unit furnishes SAE CAN J1939 interface. Further to LED indication on the front panel, it has a graphic LCD display as well as additional keys for local access to alarm log and configuration.

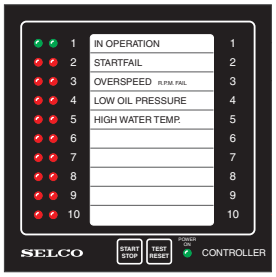
SELCO Engine Controllers offer the following features:

- Easy adaption to practically any diesel engine
- Intuitive front panel designs ensuring user friendly operation
- Connection terminals with corresponding text description ensuring easy installation
- Extended number of inputs and outputs for alarm monitoring. Both digital and analogue
- Compatibility with different types of speed measuring sensors
- Compatibility with both discreet measuring sensors and CAN SAE J1939 data
- Shut-down protection with flexible configuration options
- Redundant power supply and cable monitoring ensuring high performance reliability
- Easy accessible alarm log. Stored on SD-RAM card or PC through USB connection
- Various ways of configuration. Without PC, or with PC through USB or RS232 connection
- MODBUS RTU interface enabling integration with external control and monitoring system

Emergency Shut-down Units

SELCO Emergency Shut-down units provide protection for any type of diesel engine. The units can be mounted inside a switch panel using DIN rail brackets or screwed on to any kind of back plate fixture on the engine or in a switch panel.
SELCO Emergency shut-down units provide:

- Design based on discreet logic as required in marine applications
- Several user configurable inputs in addition to the primary "overspeed" input
- Versatile use as stand-alone primary shut-down unit, or as a back-up safety device
- LED indication and text description corresponding with connection terminals



M2000 Features

The M2000 offers integrated control and protection of diesel and gas engines. The unit has a compact design for switch panel mounting.

User friendly operation

Engine status and alarms are indicated on removable text label enabling customized description. Corresponding clear LED indication is included for each input and then the unit furnishes buttons for local start/stop and test

Versatile use

The SELCO M2000 Engine Controller is designed for basic control and protection of engines based on dry contact relay inputs and discreet logic as widely seen in marine and offshore installation.

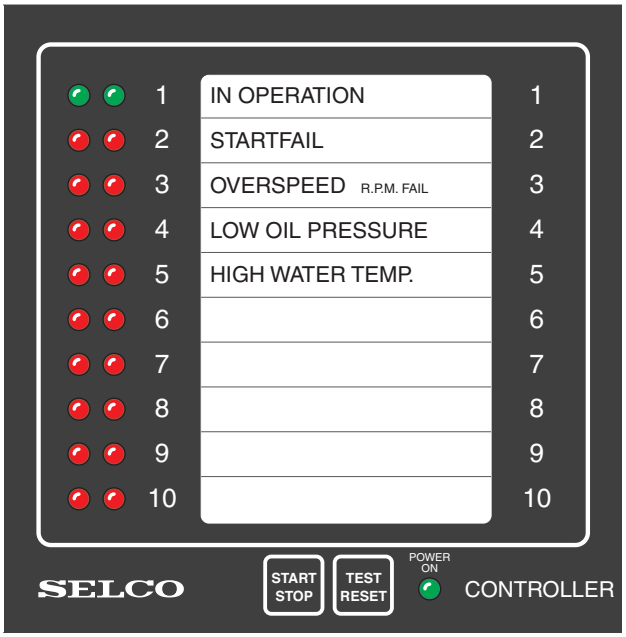
It controls start and stop of the engine, monitors and protects the engine during start and operation, and simultaneously indicates the engine and alarm status on the front of the unit.

Inputs and outputs

The M2000 offers many connection possibilities. It has 9 shut-down inputs and/or 7 user selectable alarm inputs. It is controlling the cranking, fuel valve and stop solenoid of the engine through its input/output connections and it also has connections for control of intermittent pre-lubrication.

The unit includes a dedicated input for selecting remote or local (manual) start/stop. Connecting a multi switch to this input enables remote mode selection between “auto”, “manual” and “off “.

Start is obtained by activating the start input from a remote contact or by pushing the start button of the unit, if in manual mode. After a user configured delay the start will be initiated. It is possible to configure the unit to do up to 4 start attempts, with user configurable crank and rest periods.



When the engine fires cranking will be disconnected by activating the crank disconnect input from a tacho relay trip or from a direct measurement from a tacho pick up. Default level is 33% of the nominal speed.

When stopping the engine a generator circuit breaker trip is available for gen-set applications. A stop delay can be configured for optimum cooling down.

Speed detection

Speed detection by magnetic tacho pick up, tacho relay or tacho voltage detector (with gen-sets)

Cable monitoring

M2000 includes cable check of all inputs in addition to the alarm monitoring related to critical parameters such as overspeed, low oil pressure and high cooling water temperature.

Configuration and installation

Basic configuration can be set by dip-switches on the rear or the unit. Extended configuration is possible using a PC.

Easy installation is ensured by means of clamping fittings, and plug-in connection terminals.

MODBUS RTU

The M2000 also has an RS485 interface enabling MODBUS RTU communication.

M0200 CAN-Bus Converter Unit

Connecting an M0200 CAN Bus converter unit provides the possibility of controlling common rail type of diesel engines with electronic control modules (ECM) through SAE CAN J1939 communication.

The M0200 continuously reads engine speed, oil pressure and cooling water temperature from the ECM of the engine. Readings are transferred to the M2000 from the discreet contact outputs. The M0200 supports the cable check function of the M2000.

M0600 Emergency Shut-down Unit

The M0600 provides protection for any type of diesel or gas engine.

The unit has dedicated inputs for overspeed, low oil pressure and a user configurable input that can be used for e.g. high cooling water temperature. The unit also has inputs for use to indicate if the engine is running or stopped.

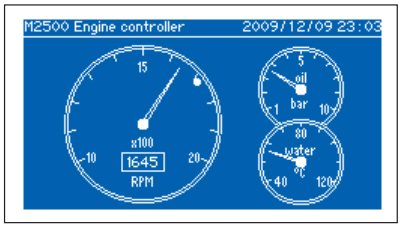
M2500 Features

The M2500 is an advanced unit offering many extended features, as well as versatile I/O and interfacing options in addition to the basic start/stop functionality and engine protection.

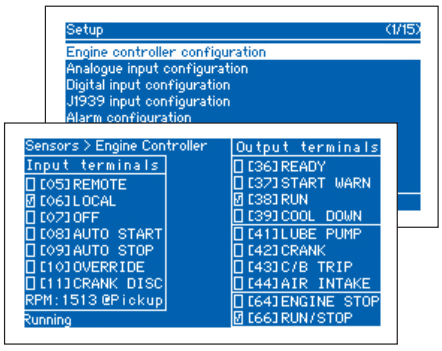
The M2500 is designed for flush mount installation on the engine itself or in the door of a control switch panel.

Intuitive user interface

The front panel has a large back-lit LCD display, separate LEDs with corresponding text for indication of engine status during start/stop and alarms, and keys with self-explanatory indication enabling user friendly operation and configuration.



During operation the primary engine parameters - engine rpm, oil pressure and cooling water temperature – are clearly shown as large gauges. Specific measurements and the alarm log can be shown in the display at any time by use of the navigation keys.



Flexible configuration

The M2500 is fully configurable using the keys on the front. All settings will be shown in the display during configuration. Access to the configuration menu is easily obtained by pushing a dedicated key. The access can be password protected thus allowing only authorized persons to carry out changes in the set-up.

SD RAM card

Configurations can be up- and downloaded from an SD RAM card. Subsequently setting up several units with the same configuration can be carried out rapidly by plugging the card into the units one by one and uploading the configuration to each unit.

During operation the alarm log is also saved on to the SD RAM card in real time.

This facilitates service as it is possible to take out both configuration and alarm log data from the unit without connecting a PC at the engine site where the work space might be limited, and instead work with the data at a more comfertable location e.g. in the work shop,

USB link for configuration and log

When the M2500 is connected to a PC via USB, it is detected by the PC as an external USB hard-disc.

Two new drives become available in the file manager of the PC, containing configuration and log files respectively.

The M2500 then copies the configuration and log inspection utilities to the drives. This allows the user to access configuration and log directly from the drives from any PC, without first having to install external drivers or configuration software on the PC.

Inputs and outputs

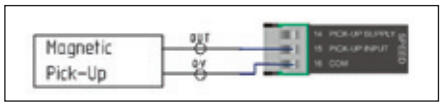
The M2500 furnishes an extended number of digital and analogue inputs, as well as SAE CAN J1939 interface. Subsequently the M2500 can be used with practically any type of diesel engine, as it can control both modern common rail engines by direct communication with the ECM of the engine, and engines using discreet control signals.

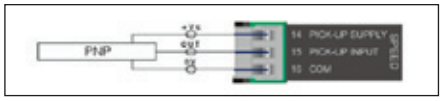
All inputs are potential free dry contacts. Mode selection and remote start/stop is set up using dedicated inputs. Engine control and status signals are provided on dedicated outputs.

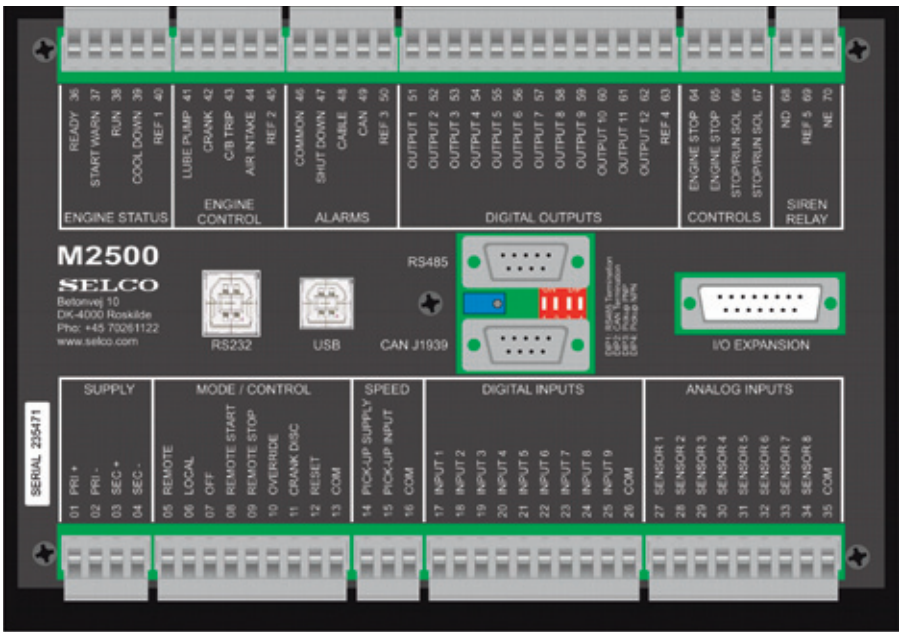
All sensor inputs (Speed measurement, analogue and digital inputs, and J1939 signals) are available for user defined engine monitoring, and then 12 programmable outputs are provided for alarm purposes.

Speed detection

Engine speed (rpm) can be measured by both magnetic and inductive pick-ups. Alternatively an external tacho relay can be used for discreet speed detection.







Cable monitoring

Cable monitoring, both short circuit and cable break, can be set individually on all sensor inputs. Also cable monitoring can be set for the shut-down output connected to the fuel valve or stop solenoid.

Redundant power supply

To ensure reliable operation M2500 additional has a secondary connection for redundant power supply

Integrated alarm monitoring and shut-down protection

All sensor inputs are monitored by the integrated alarm system. The alarm monitoring is flexible as alarm conditions can be set individually for each input. It virtually can work in the same way as a separate alarm panel. When a sensor signal exceeds a configured trigger level, an alarm or shut-down is generated.

Alarms and shut-downs are related to individual user defined descriptions that will appear in the LCD display and alarm log. Delays, monitoring options, sensor inputs and corresponding outputs to be activated are also set individually.

In addition the M2500 provides predefined LED indication on the front, and dedicated outputs for alarms, shut-down, communication errors and cable faults.

Shut-downs as opposed to alarms initiate an emergency stop of the engine, and block the engine for restart until the shut-down condition is no longer present, and has been acknowledged.

All alarms and shut-downs are saved in the alarm log in the order they appear.

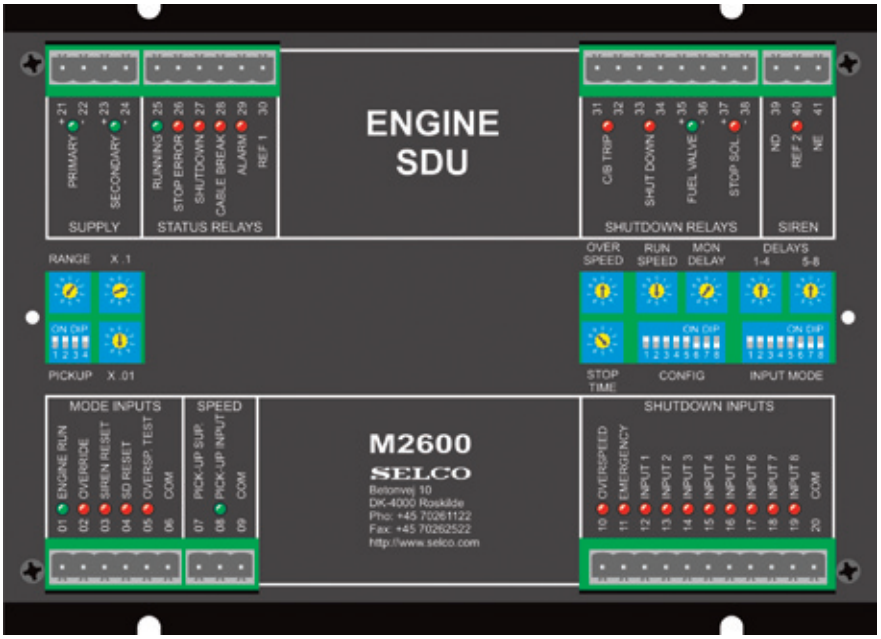
MODBUS RTU

M2500 furnishes an RS485 interface for MODBUS RTU communication thus providing the possibility of remote monitoring and control via SCADA systems

SELCO can offer HMI's as touch screen solutions i various.

M2600 Features

The M2600 Shut-down Unit is a back-up protection device designed for marine engines. It is ensuring safety shut-down of the engine in case normal primary shut-down fails.



Together with SELCO Engine controller units M2000 or M2500 or other engine controllers it can be used to build a complete control, alarm and safety system for marine engines.

Alternatively it can work as a stand-alone primary shut-down unit in simple applications where shut-down functionality is not included in the start/stop device of the engine.

Reliable performance

The M2600 design is based entirely on discreet logic, thus meeting requirements to safety shut-down devices from the marine classification societies.

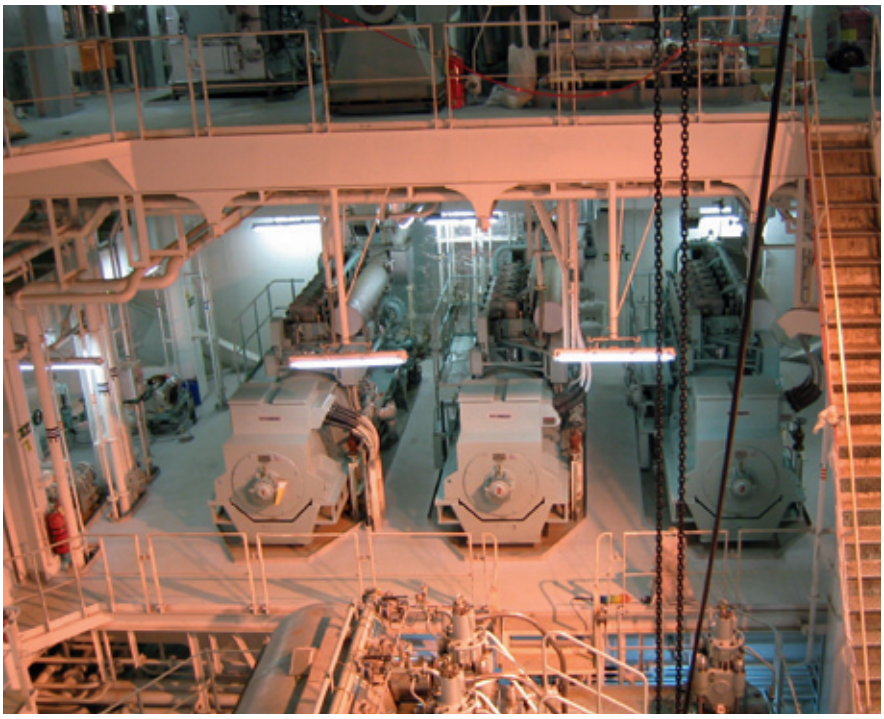
Inputs and Outputs

All inputs and outputs of the M2600 have corresponding LED indication clearly showing whether they are active or not.

The unit furnishes 10 digital shut-down inputs. 1 is pre-defined for overspeed and another for emergency stop. All inputs are potential free dry contacts.

Output relays are provided for control of the fuel valve and the stop solenoid when stopping the engine in normal conditions. Then another output relay is provided for emergency shut-down.

Additionally the unit provides an output for circuit breaker trip for use with gen-sets



Speed detection

Engine speed (rpm) can be detected from magnetic and inductive pick-ups connected to dedicated inputs. Alternatively the speed can be detected from a digital input.

Cable monitoring

Likewise the M2500 Engine controller the M2600 provides cable monitoring, both short circuit and cable break, to be set individually on all sensor inputs. Also cable monitoring can be set for the shut-down relay ouputs.

Redundant power supply

M2600 also has a secondary connection for redundant power supply.

Configuration and installation

Configuration is made solely with the dip-switches and rotary switches on the unit.

A screw mount plate is supplied with the unit for blinding the switches when the unit is put in operation.

The M2600 is designed for screw mounting e.g. on a back plate inside the switch panel. All terminals are sturdy plug-in types ensuring solid connection and easy wiring at the same time.

Clear text descriptions are provided in correspondence with all connection terminals, dip-switches and rotary switches.

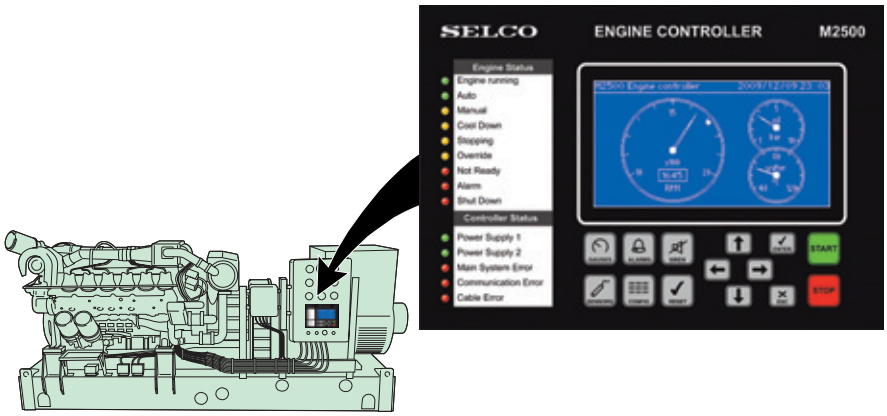
Applications

SELCO Engine controllers and shut-down units are designed primarily for use with marine engines.

The M2500 could nevertheless provide a strong solution in numerous other applications where diesel engines are used as a prime mover.

The high number of user configurable inputs enable monitoring of other parameters than the basic diesel engine parameters, over-speed, low oil pressure and high cooling water temperature.

Subsequently the M2500 is able to detect alarms and give shut-down related to critical measurements from the equipment the engine would be driving, in addition to critical measurements related to the engine itself.



Applications where SELCO Engine controllers can be used include:

- Gen-sets
- Propulsion engines
- Fire fighting pumps on board ships and offshore platforms
- Crude oil pumps in oil wells and pipelines
- Sludge pumps on dredgers
- Dewatering pumps in mines
- and more…

Function overview

Function / Model	M2000	M2500	M2600
Remote Start/stop	√	√	
Digital alarm/shut-down inputs	7+over-speed	9	10
Analogue alarm/shut-down inputs		8	
SAE CAN J1939		√	
User configurable start attempts	√	√	
User configurable alarm/shut-down delays		√	√
Starter engagement protection	√	√	
Harbour /emergency mode selection (override)	√	√	√
Speed detection by tacho relay	√	√	√
Speed detection by magnetic pick-up	√	√	√
Speed detection by inductive pick-up (NPN or PNP)		√	√
Control/alarm/shut-down outputs with fixed function	3 (open collector) + 1 (dry contact)	14 (dry contacts)	10 (dry contacts)
User configurable alarm/shut-down outputs	8 (open collector)	12 (dry contacts)	
Circuit breaker trip output	√	√	√
Control output for lubrication pump	√	√	
Cable monitoring on sensor inputs	√	√	√
Cable monitoring on shut-down outputs		√	√
Redundant Power supply		√	√
Galvanic isolation between supply voltage and outputs		√	√
Graphic LCD display		√	
Alarm log		√	
Service counter and alarm		√	
Configuration and alarm log stored on SD-RAM card		√	
Configuration from PC	RS232	USB	
Configuration directly on the unit	Dip-switches	Front panel keys	Dip-switches
MODBUS RTU (RS485 interface)	√	√	

About SELCO

Since the origin in 1960, SELCO technology has provided the electrical power generation market with high class equipment, living up to the major international standards.

Generator Control, Protection & Monitoring

– Generator protection:
Short circuit, overcurrent, reverse power, excitation loss, engine protection.
– Generator controls:
Synchronizing, frequency control, active and reactive load sharing, load control, power management, engine control.
– Generator monitoring:
Voltage, frequency, power, insulation.

Alarm Annunciation and Indication

– Monitoring of current, temperature or pressure
– Indication of alarms
– Logging of alarms and events

Arc Detection

– Arc detecting relay
– Current relay
– Time relay

Main Office:
SELCO A/S
Betonvej 10
DK- 4000 Roskilde
Denmark
Tel.: + 45 - 70 26 11 22
Fax: + 45 - 70 26 25 22
e-mail: selco.dk@selco.com

SELCO China Ltd.
Room 428
550 Mincheng Road
200135 Shanghai Pudong
China
Tel.: + 86 - 2150281391
Fax: + 86 - 2150282025
e-mail: tp_he@selco-china.com

SELCO ME L.L.C
P.O. Box 52898
Dubai
United Arab Emirates
Tel.: + 971 - 4 3413660
Fax: + 971 - 2 3413770
e-mail: selco.ae@selco.com

SELCO SE Asia Pte. Ltd.
50, Tuas Lot, Tuas Avenue 11, #3-25
Singapore 639107
Singapore
Tel.: +65 – 6316 2204
Fax: +65 – 6316 2203
e-mail: selco.sg@selco.com

www.selco.com

Engine Controllers 1008U K
Cool Gray A/S