

Autostart AS732

Automatic Generator Controller

ms6343
revision A, 1st July 2003
catalogue section 75



- **Single or multi-genset, automatic or manual control**
- **RS485 MODBUS communication**
- **Remote monitoring and control software, Windows® compatible**

Description

The AS732 is a full-featured, programmable controller for use with single or multiple generator systems. The module provides automatic or manual genset control and load switching engine and AC fault warning and shutdown protection, plus RS232 and RS485 MODBUS RTU communications.

Other standard features include:-

- 32 character, back-lit LCD displays engine and generator parameters
- Full programmability of inputs, outputs, timers, trip levels and control options (details overleaf).
- Monitoring, display and programmable fault limits for 1, 2 or 3 phase generator voltage, frequency and current.
- Display of engine oil pressure and temperature, with programmable warning and shutdown levels.
- Free of charge remote communications software for PC/Windows®

Application

The AS732 is designed for use with unmanned, standby or base-load diesel generator applications. The comprehensive control, measurement and display features allow this unit to be used in place (and at a fraction of the cost) of multiple control units, trip units and indicating gauges.

RS232 communications and Murphy PC software provide remote monitoring, control and fault notification. The RS485 MODBUS RTU interface provides for multi-genset control systems and seamless integration with PLC, SCADA or building management systems.

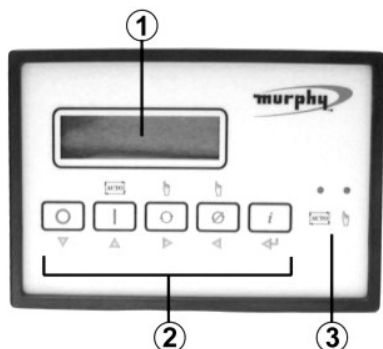
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MURPHY®

Specification

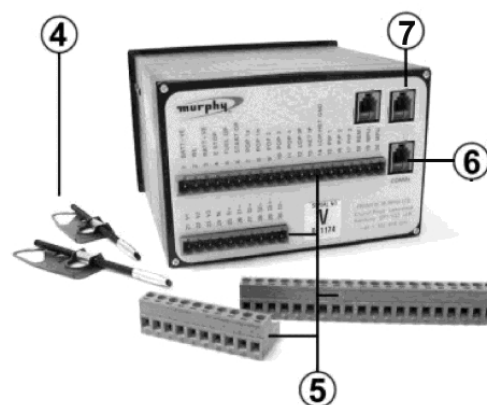
Power supply:	
operating voltage: steady state range	5 – 40 V DC continuous
crank brown-out	to 0 V for >=100mS
current consumption: standby (typ)	95mA @ 12V, 55mA @ 24V
cranking (typ)	280mA @ 12V, 170mA @ 24V
Inputs:	
DC inputs:-	
positive input defined as:	80% to 100% of battery positive
negative input defined as:	-1V to +2V w.r.t. battery negative
inputs 1 and 2 (oil pressure and engine temperature)	switch (open or closed) or analogue (Murphy, Datcon, VDO 5 or 7 bar), wired to negative DC open or closed to negative DC
inputs 3 – 5	
generator AC:-	
operating voltage range	3 phase, 90-300 VAC rms L-N
gen. volts display resolution	1 VAC
gen. frequency measurement range	0 – 99 Hz.
gen. frequency display accuracy	<= 2% of full scale
gen. frequency display resolution	1 Hz.
magnetic pickup:	
operating voltage range	2.5 – 25 V AC rms
frequency measurement range	0 – 10 kHz.
engine RPM display accuracy	<= 2% of full scale
engine RPM display resolution	10 RPM
AC current sensing inputs:	
operating range	designed for use with 5 Amp CT's primary ratings 10 to 5000 Amps (all ratings for resistive load)
Outputs:	
start and fuel relays	positive DC (switched relay) rated 16 A max. @ 24 V DC
programmable output 1 (default setting: gen. contactor)	volt free SPNO relay 5 A max. @ 240 V AC
programmable outputs 2 – 4	negative DC (semiconductor) 500 mA max. @ 33 V DC
Communications:	
RS232 port connector	RJ11
RS232 Baud rate	9600
RS232 max. lead length	10 metres
RS485 port connector	2 x RJ45
RS485 Baud rate	9600
RS485 maximum network length	1000 metres
RS485 protocol	MODBUS RTU
Physical:	
overall dimensions (W x H x D)	144 x 96 x 162 mm
panel cut-out size (W x H)	DIN standard 140 x 92 mm
weight	approx. 770 g
operating ambient temperature	-10 to +55 °C

Front facia



- 1) 2 line x 16 character backlit liquid crystal display
- 2) Operator control keys:-
 - Off/stop/reset
 - On/Auto mode
 - Manual mode start
 - Manual mode stop
 - Info (scroll display)
- 3) Auto/manual mode LED indication

Rear facia

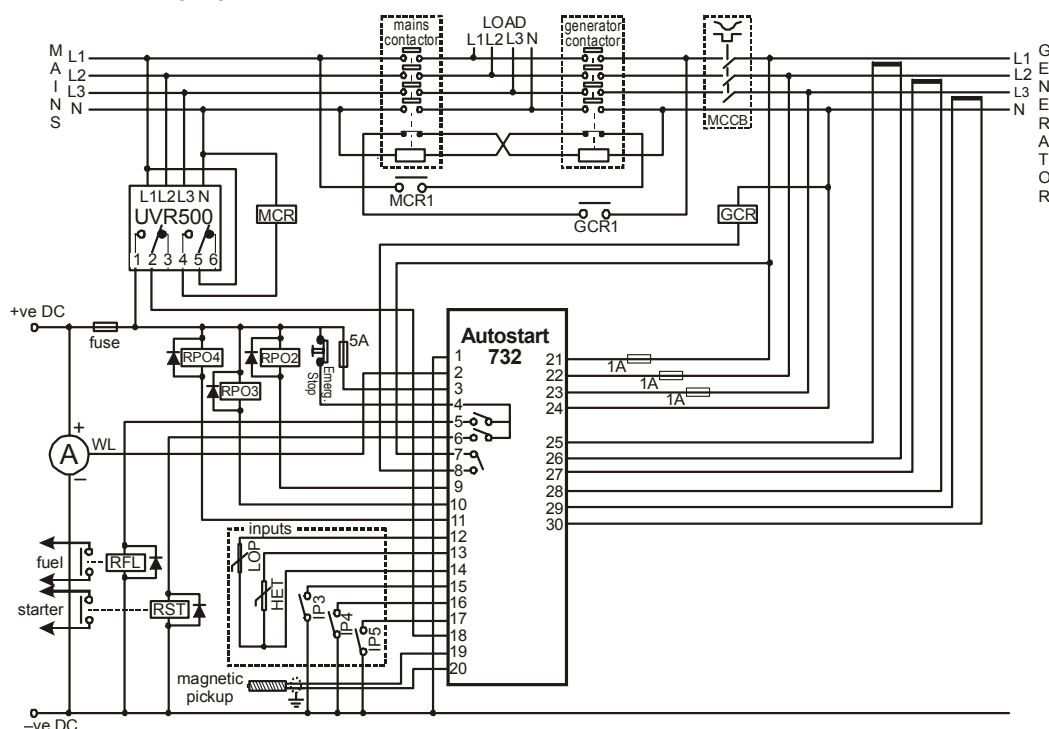


- 4) Mounting clamps
- 5) 2 x two part, screw terminal blocks, 1 – 20 and 21 – 30
- 6) RS232 communication port (RJ11 connector)
- 7) RS485 comms ports (2 x RJ45 connectors)

Electrical connection

- | | | | |
|----|--|----|-------------------------------|
| 1 | Battery / DC negative supply | 21 | Generator AC V1 |
| 2 | Charge fail / WL | 22 | Generator AC V2 |
| 3 | Battery / DC positive supply | 23 | Generator AC V3 |
| 4 | Emergency stop (positive input for fuel/starter outputs) | 24 | Generator AC N |
| 5 | Fuel output (positive DC) | 25 | Generator current (5A CT) I1+ |
| 6 | Start output (positive DC) | 26 | Generator current (5A CT) I1- |
| 7 | Output 1a (volt free relay contacts) | 27 | Generator current (5A CT) I2+ |
| 8 | Output 1b (volt free relay contacts) | 28 | Generator current (5A CT) I2- |
| 9 | Output 2 (negative DC, semiconductor) | 29 | Generator current (5A CT) I3+ |
| 10 | Output 3 (negative DC, semiconductor) | 30 | Generator current (5A CT) I3- |
| 11 | Output 4 (negative DC, semiconductor) | | |
| 12 | Input 1: oil pressure (sender or switch, to negative DC) | | |
| 13 | Input 2: engine temp. (sender or switch, to negative DC) | | |
| 14 | Input 1/2 return/ground | | |
| 15 | Input 3 (switch, close to / open from negative DC) | | |
| 16 | Input 4 (switch, close to / open from negative DC) | | |
| 17 | Input 5 (switch, close to / open from negative DC) | | |
| 18 | Remote start input (open from / close to positive DC) | | |
| 19 | Magnetic pickup + / high | | |
| 20 | Magnetic pickup - / low | | |

Typical connection (single genset AMF application)

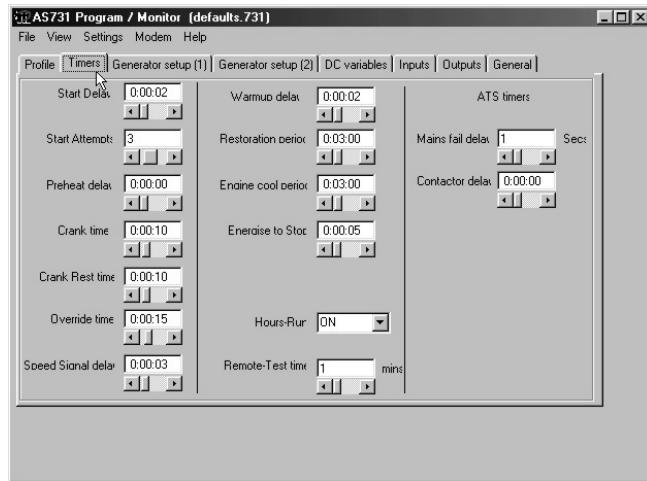


AS7CN PC software

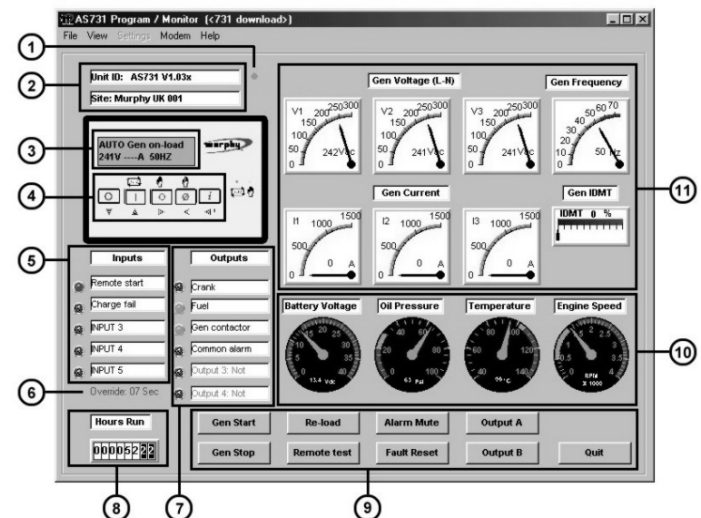
Software model AS7CN is available as free of charge from www.fwmurphy.co.uk/download. The software allows local or modem RS232 communication between a Windows®-based PC and an AS732 'master' controller.

Once a link has been established, the software enables remote programming, monitoring and control of the Autostart and generator. For AS732 multi-genset applications, the 'master' AS732 allows the PC operator to monitor and control any other AS732 'slave' unit connected via its RS485 network.

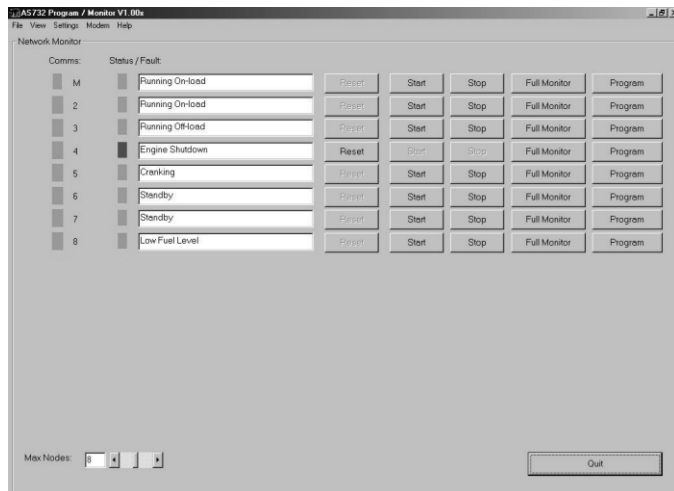
Typical program mode screen:-
(see below for full program options list)



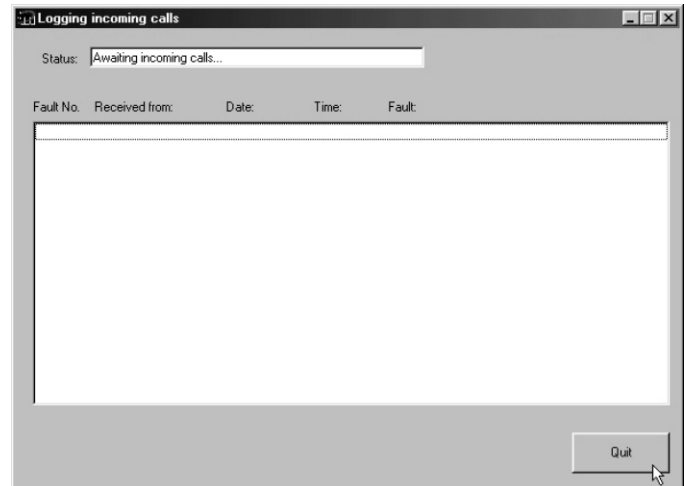
Typical monitoring screen (single genset detail):-



Typical monitoring screen (multi-genset overview):-



Typical fault notification screen:-

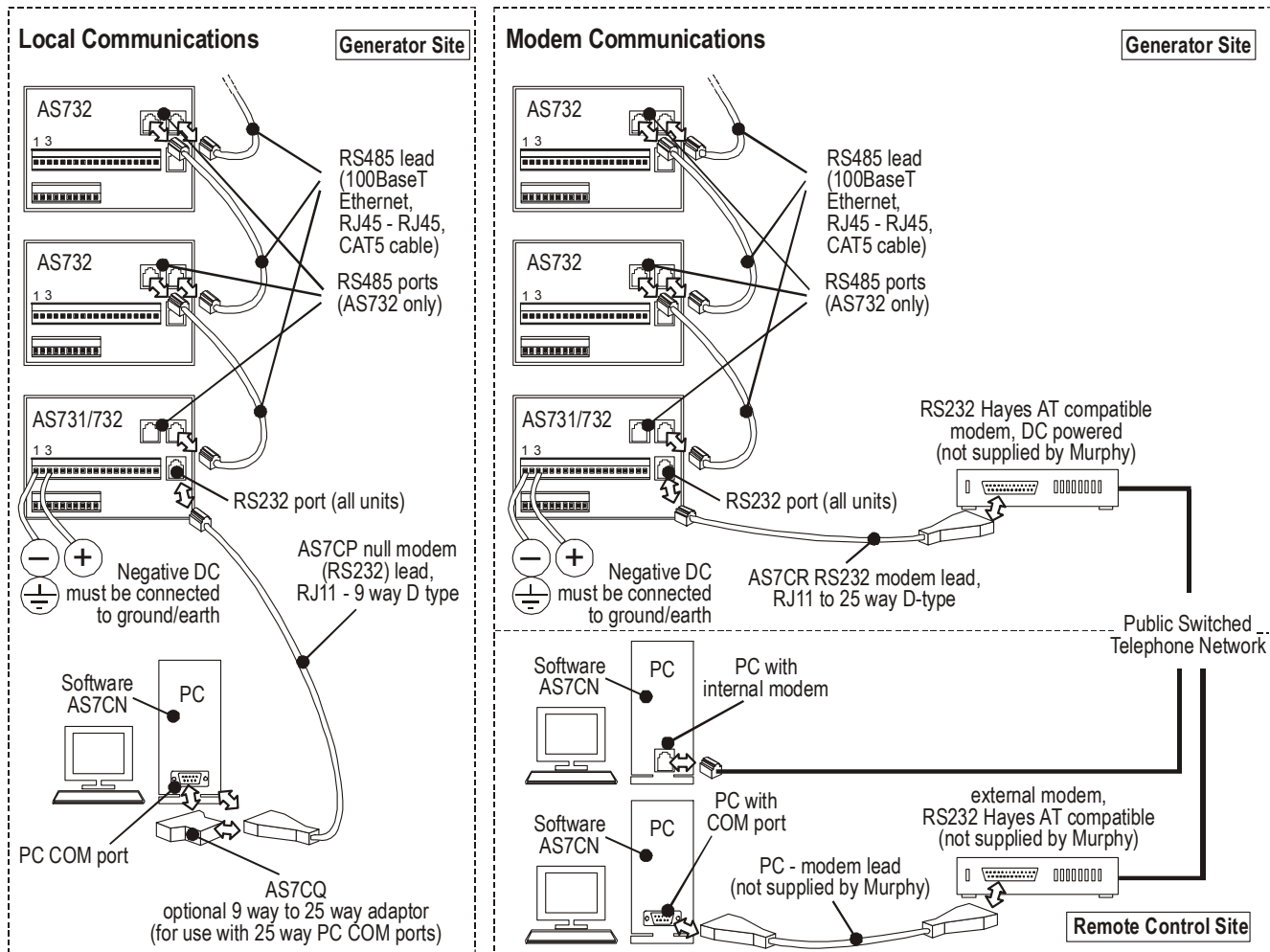


Program options

The AS732 has over 60 programmable functions, allowing complete flexibility of inputs, outputs, timers and engine/generator control options. Program configuration may be carried out from the front facia or by software AS7CN and RS232 link.

Timers:	Start delay; crank time; crank rest time; number of start attempts; alarm override (on start); speed signal/overshoot delay; engine warm-up delay; (mains) restore delay; engine cool time; energised to stop time; remote test time.
Battery DC	Low and high battery volts warning; charge alternator fail voltage; charge start (low battery) voltage; charge start period.
Generator AC	1/2/3 phase selection; over/under voltage levels; under voltage response; over/under speed/frequency levels; under speed/freq. response. Over current settings: full load; CT ratio; IDMT constant; warning/shutdown response.
Inputs	2 x analog/switch inputs, 1 (oil pressure) and 2 (engine temp): sender/switch type; display units; warning/shutdown levels. 3 x switch inputs: open/closed to activate; input 'action' (15 options including shutdown fault, warning fault, load release, test, start, stop, manual restore, etc); programmable fault messages.
Outputs	4 outputs, each with 50+ control or fault signalling options.
General	Access ID codes; unit/site ID; power up message; RS485 address.

AS732 Communication



How to order

Stock no. Model, description
76.70.0338 AS732 generator controller

Optional accessories:-

76.70.0310 AS7CP, local RS232 comms (null modem) lead, for use with 9 way PC COM ports
76.70.0312 AS7CQ, adapter for above when using 25 way PC COM ports
76.70.0311 AS7CR modem RS232 lead, RJ11 to 25 way D type connectors

Software model AS7CN is available for free of charge download from our web site:
www.fwmurphy.co.uk/download

Warranty

A two year limited warranty on materials and workmanship is given with this Murphy product. Details are available on request and at www.fwmurphy.co.uk/warranty.

Further information

Doc. ref.	Title
mi6128	AS731/732 installation A: fitting and connection
mi6129	AS731/732 installation B: programming
mi6243	AS731/732 installation C: AS730 to AS731/AS732 retrofitting
mi6130	AS731/732 operation
mi6131	AS731/732 and PC software model AS7CN
mi6344	AS732 RS485 MODBUS RTU protocol



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