F500 Elite.

FIELDBUS ADAPTER.

Watchdog NTC to Modbus RTU communications.

(Software Version 3.3.0)

Approvals: Suitable for use in Hazardous Locations
CL II Div 1 GPS E, F & G (CANADA ONLY)
CL II Div 2 GPS F & G (USA ONLY)

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Dear 4B Customer:

Congratulations on your purchase. 4B appreciates your business and is pleased you have chosen our products to meet your needs.

Please read in its entirety and understand the literature accompanying the product before you place the product into service. Please read the safety precautions carefully before operating the product. With each product you purchase from 4B, there are some basic but important safety considerations you must follow to be sure your purchase is permitted to perform its design function and operate properly and safely, giving you many years of reliable service. Please read and understand the Customer Safety Responsibilities listed below. Failure to follow this safety directive and the Operation Manuals and other material furnished or referenced, may result in serious injury or death.

SAFETY NOTICE TO OUR CUSTOMERS

A. In order to maximize efficiency and safety, selecting the right equipment for each operation is vital. The proper installation of the equipment, and regular maintenance and inspection is equally important in continuing the proper operation and safety of the product. The proper installation and maintenance of all our products is the responsibility of the user unless you have asked 4B to perform these tasks.

B. All installation and wiring must be in accordance with Local and National Electrical Codes and other standards applicable to your industry. (Please see the article “Hazard Monitoring Equipment Selection, Installation and Maintenance” at www.go4b.com.) The installation of the wiring should be undertaken by an experienced and qualified professional electrician. Failure to correctly wire any product and/or machinery can result in the product or machine failing to operate as intended, and can defeat its design function.

C. Periodic inspection by a qualified person will help assure your 4B product is performing properly. 4B recommends a documented inspection at least annually and more frequently under high use conditions.

D. Please see the last page of this manual for all warranty information regarding this product.

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1. READ ALL LITERATURE PROVIDED WITH YOUR PRODUCT

Please read all user, instruction and safety manuals to ensure that you understand your product operation and are able to safely and effectively use this product.

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Every customer and operation is unique, and only you best know the specific needs and capabilities of your operation. Please call the 24-hour hotline at 309-698-5611 for assistance with any questions about the performance of products purchased from 4B. 4B is happy to discuss product performance with you at any time.

3. SELECT A QUALIFIED AND COMPETENT INSTALLER

Correct installation of the product is important for safety and performance. If you have not asked 4B to perform the installation of the unit on your behalf, it is critical for the safety of your operation and those who may perform work on your operation that you select a qualified and competent electrical installer to undertake the installation. The product must be installed properly to perform its designed functions. The installer should be qualified, trained, and competent to perform the installation in accordance with Local and National Electrical Codes, all relevant OSHA Regulations, as well as any of your own standards and preventive maintenance requirements, and other product installation information supplied with the product. You should be prepared to provide the installer with all necessary installation information to assist in the installation.

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You should develop a proper maintenance and inspection program to confirm that your system is in good working order at all times. You will be in the best position to determine the appropriate frequency for inspection. Many different factors known to the user will assist you in deciding the frequency of inspection. These factors may include but are not limited to weather conditions; construction work at the facility; hours of operation; animal or insect infestation; and the real-world experience of knowing how your employees perform their jobs. The personnel or person you select to install, operate, maintain, inspect or perform any work whatsoever, should be trained and qualified to perform these important functions. Complete and accurate records of the maintenance and inspection process should be created and retained by you at all times.

5. RETAIN AND REFER TO THE OPERATION MANUAL FOR 4B'S SUGGESTED MAINTENANCE AND INSPECTION RECOMMENDATIONS

As all operations are different, please understand that your specific operation may require additional adjustments in the maintenance and inspection process essential to permit the monitoring device to perform its intended function. Retain the Operation Manual and other important maintenance and service documents provided by 4B and have them readily available for people servicing your 4B equipment. Should you have any questions, please call the 4B location who supplied the product or the 24-hour hotline number in the USA -309-698-5611.

6. SERVICE REQUEST

If you have questions or comments about the operation of your unit or require the unit to be serviced please contact the 4B location who supplied the product or send your request via fax (309-698-5615), email (4b-usa@go4b.com), or call us via our 24-hour hotline number in the USA - 309-698-5611. Please have available product part numbers, serial numbers, and approximate date of installation. In order to assist you, complete the following information after the product has been placed into service and fax this page to 309-698-5615.

SITE NAME:
SITE LOCATION:
CONTACT NAME:
CONTACT NUMBER:
PART NUMBER:
SERIAL NUMBER:
DATE OF INSTALL:

F500 FIELDBUS ADAPTER.

INTRODUCTION

This version of the F500 Elite Fieldbus adapter had been designed to work as a Watchdog Elite communications gateway and has been designed specifically to allow up to 10 Watchdog NTC control units to be networked together through their own built in communications system. The network data can then be passed through the Fieldbus adapter to a Modbus RTU network. The communications control unit is housed in a self-contained wall-mounting enclosure, and will operate from 100-240v AC or from 24v DC.

1. SPECIFICATIONS

1.1 The Control Unit

A plastic enclosure houses the electronics and terminal connectors. The unit contains a printed circuit board to accommodate power supply circuitry, microprocessor, Fieldbus card and terminals. The design is capable of accommodating 8 of the most common Fieldbus interfaces.

Electrical Supply	–	100-240VAC +/- 10% 50/60Hz
	-	24VDC +/- 10%
Power Consumption	-	12 WATTS
Terminals	-	Power 4mm² 14 AWG max
	-	Communications, as appropriate to the Fieldbus module.
Protection	-	NEMA12,IP65
Height	-	9.7”, 246mm
Width	-	7.4”, 188mm
Depth	-	4”, 102mm
Fixing Centres	-	8.75” high x 4” wide, 222mm x 102mm
Cable Entry	-	2 Holes 11/8” DIA, 28mm, ¾” CONDUIT
Weight	-	3lbs, 1.3Kg

Approvals: Suitable for use in Hazardous Locations
CL II Div 1 GPS E, F & G (CANADA ONLY)
CL II Div 2 GPS F & G (USA ONLY)

2. INSTALLATION INSTRUCTIONS

The Control Unit

The Control Unit box should be installed in a suitable control or starter switch room. The box should have sufficient space to open the lid for wiring.

The Control Unit is susceptible to static voltage. Connection of a clean ground to terminal 29 is essential for optimum performance. Prior to this connection, static handling precautions should be taken.

3 ELECRICAL WIRING

Refer to Drawings A, B, C & E

When installing the equipment in an area which is likely to be hazardous from Ignitable Dusts, use liquid tight conduit and fittings and follow all local codes.

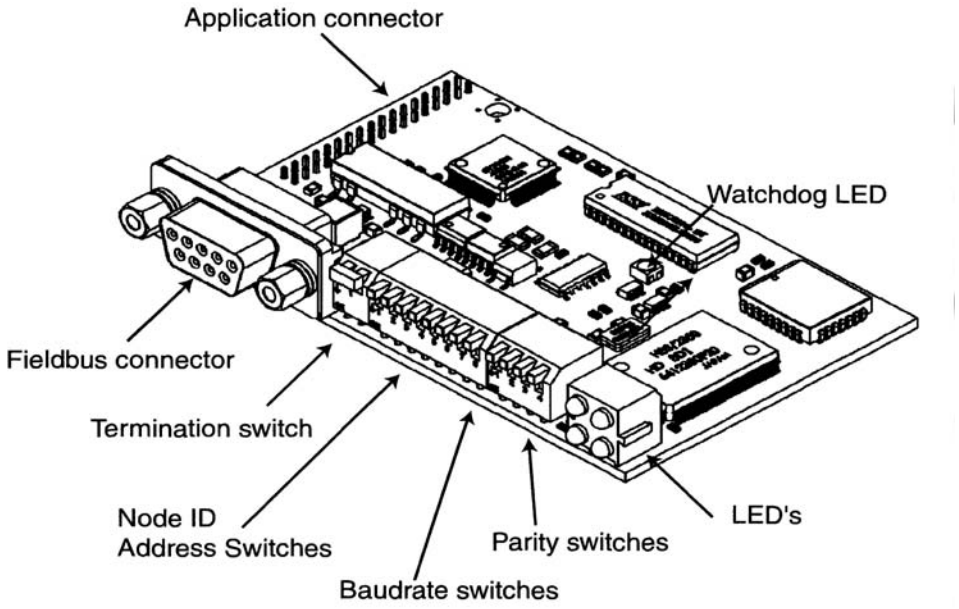
4 OPERATING INSTRUCTIONS

The Fieldbus Adapter is a self contained unit and there are a number of user configurable options. The adapter is equipped with three communications ports; RS232, RS485 and Modbus RTU.

The RS232 is a simple interface which can be used for diagnostics purposes. The data from this port is formatted to work with a VT100 display terminal. Any terminal or terminal emulator capable of supporting the VT series or compatible commands can be used with this port although the data has been optimised to work with VT100. The RS232 port operates at a fixed data rate of 9600, N, 8, 1.

The RS485 port is a four wire, twin twisted pair full duplex serial port and has been specifically configured to work with the Watchdog communications network. You should not connect any other devices to this port unless you wish to monitor the Watchdog data directly. If this is the case then contact your supplier for details relating to the Watchdog communications protocol.

The Modbus RTU port conforms to the Modbus interface specification for RS232 and RS485 two wire communications

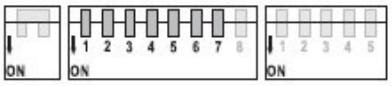


The above diagram shows the location of the main parts of the Modbus RTU module.

Following is a representation of the configuration switch for the F500 Modbus RTU interface.

Modbus address selection switches.
(See Appendix 'A' for further detail.)

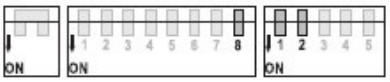
Binary value	Modbus address
0000000	Setting not valid
00000001	1
00000010	2
00000011	3
...	...
...	...
11111111	127



(switch 1 is MSB and switch 7 is LSB)

Baud rate selection

Binary value	Baud rate
000	Setting not valid
001	1200
010	2400
011	4800
100	9600
101	19200 (Default on RTU)
110	38400
111	57600

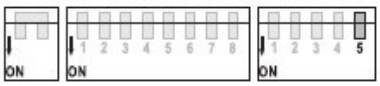


(switch 8 is MSB and switch 2 is LSB)

Binary value	Parity type
00	Setting not valid
01	None (Default on RTU)
10	Even
11	Odd

(switch 3 is MSB and switch 4 is LSB)

Binary value	Parity type
0	RS-485
1	RS-232



When using the RS-485 option you may need to use terminations resistors if the F500 it at the end of the Modbus communications cable. Switch bank 1 on the far left is used to select the termination resistors.

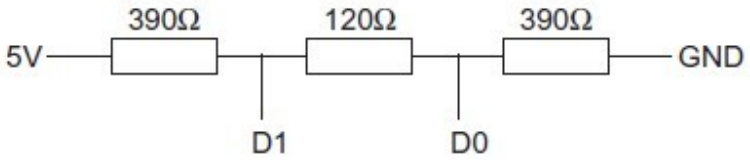
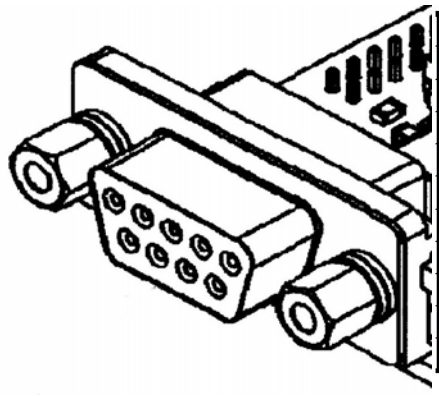


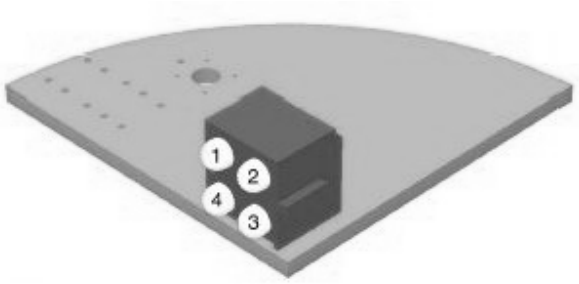
Figure 3: Internal terminator

The Modbus RTU connections are shown below.



Pin	Name	Function
Housing	SHIELD	Cable shield
1	-	Not connected
2	RS232 - TX	Transmit signal
3	RS232 - RX	Receive signal
4	-	Not connected
5	GND	Signal ground
6	+5V	Power supply
7	RS 485 D0	
8	RS 485 D1	
9	-	Not connected

The statuses LED's are grouped in a single block of four and indicate the following.



Led 1 - Processing

Colour	*Frequency*	*Description*
Off	Off	No query is being handled by the module at the moment
Green	Flashing	The module is receiving a query and is building a response

Led 2 – Bus Error

Colour	*Frequency*	*Description*
Red	Steady on	Bus Error (More than 1/10 of all queries have incorrect CRC)
Off	Off	Normal operation, or module not initialised

Led 3 – Bus Ready

Colour	*Frequency*	*Description*
Green	Steady on	Bus is ready (Normal Operation)
Red	Steady on	Bus timeout error
Off	Off	Module is not initialised correctly

Led 4 – Hardware setting status

Colour	*Frequency*	*Description*
Off	Off	The Modbus switch settings are ok and in use
Red	Steady On	Modbus switches are set to an illegal state

Watchdog Led (see the diagram on page 5)

Colour	*Frequency*	*Description*
Off	Off	The module is not receiving power
Green	0.5 Sec Flash	The module is powered but not yet initialised
Green	1.0 Sec Flash	The module is powered and correctly initialised
Red	Steady On	The module has detected an internal fault condition

The data may be read from the F500 using the 'Read Input Registers' or 'Read Holding Registers'

Watchdog Address	Input Words	Input Byte
-	0	0-1
1	1 – 17	2 – 35
2	18 – 34	36 – 69
3	35 – 51	70 -104
4	52 – 68	105 -137
5	69 – 85	138 -171
6	86 – 102	172 - 205
7	103 – 119	206 - 239
8	120 – 136	240 - 273
9	137 – 153	274 – 307
10	154 - 170	308 - 341

The Watchdog data is automatically read for up to 10 controllers. The data returned is processed and stored in the following format. The position of the data is fixed within the input data table.

Although data is returned in a word format, much of the data is in either byte pairs (2 bytes per word) or as two single bytes; more on this later.

Word 0 (Byte 1) is used to indicate the number of Watchdogs that are responding to the request for data. Word 0 (Byte 0) is unused. This only occurs once in the entire table. The remaining data stored in the input bytes is constructed as follows.

All the values are stored in Hexadecimal

Number of Watchdogs detected this time (Byte 1,0) Once only	0	No.Of WD	0x0200
Watchdog current speed (Byte 3,2)	1	WD1 Speed	0x0000
Watchdog current operating status (Byte 5,4)	2	Status	0x0000
Under speed alarm and stop in % (Byte 7,6)	3	USA/USS	0x0000
Over speed alarm and stop in % (Byte 9,8)	4	OSA/OSS	0x0000
Current calibration value in PPM (Byte 11,10)	5	Calibration PPM	0x0000
Display scaling factor (Byte 13,12)	6	Scale Factor	0x0000
NTC Temperature 1 and 2 (Byte 15, 14)	7	T1/T2	0x0000
NTC Temperature 3 and 4 (Byte 17, 16)	8	T3/T4	0x0000
NTC Temperature 5 and 6 (Byte 19, 18)	9	T5/T6	0x0000
NTC temperature sensor status 1 and 2 (Byte 21,20)	10	ST1/ST2	0x0000
NTC temperature sensor status 3 and 4 (Byte 23,22)	11	ST3/ST4	0x0000
NTC temperature sensor status 5 and 6 (Byte 25,24)	12	ST5/ST6	0x0000
Sensor 1 and sensor 2 alarm level (Byte 27,26)	13	ALM1/ALM2	0x0000
Sensor 3 and sensor 4 alarm level (Byte 29,28)	14	ALM3/ALM4	0x0000
Sensor 5 and sensor 6 alarm level (Byte 31,30)	15	ALM5/ALM6	0x0000
Number of sensors in use (Byte 33), Relay status (Byte 32)	16	NOS/REL	0x0000
Persistent alarm value (Byte 35), update counter (Byte 34	17	PERALM/CNT	0x0000

The data from each Watchdog is stored in 17 consecutive words (or 34 bytes) of data.
The first two bytes of the group of 34 (e.g. 3 & 2) represent the Watchdog speed.
The second two bytes of the group of 34 (e.g. 5 & 4) represent the Watchdog status.

The Watchdog speed is encoded in the following manner.
Four hexadecimal digits are used to represent the measured speed for the Watchdog. The rightmost three and a half are the main body of the speed and the upper half of the fourth is the position of the decimal place within the information. If the most significant two bits are '00' then decoding of the speed is not required. If the two bits are '01', then the resulting value should be divided by 10 and if the two bits are '10' then the speed should be divided by 100. The top two bits should never be '11' as this has no meaning.

Bit 7	Bit 6	Description (e.g. most significant bits of the first speed byte 3)
0	0	Bits 5-0 of the first byte and the whole second represent the speed.
0	1	Same as above but the speed and should be divided by 10
1	0	Same as above but the speed and should be divided by 100
1	1	Not used.

An example of this can be seen below.
Watchdog speed = 6E (e.g. byte 3) & 1E (e.g. byte 2). The leftmost digit (6) = '0110' in binary which can be separated into '01' (bits 7 and 6) for speed scaling and '10' (bits 5 and 4) for the upper speed digit. If you strip off bits 7 and 6 you are left with a decoded value of 2E & 1E for the speed and '01' or divide by 10 for the scaling. The speed 2E1E converted to decimal = 11806 and then divided by 10 results in an actual speed of 1180.6. By default the Watchdog will display speed in pulses per minute but it can be scaled to display any value required, refer to the Watchdog manual for further detail.

The Watchdog status is encoded as described in the following manner.
Two data bytes are used to represent the status for the Watchdog. The first status byte (e.g. byte 5) is the status code and the second byte (e.g. byte 4) represents any data which is associated with the status code. All data is in hexadecimal.

Status Code (Byte 5)	Status Data (Byte 4)	What it means.
09	% Complete	Watchdog is calibrating (% complete).
0F	-	Elevator is stopped due to persistent belt slip.
10	-	Elevator is stopped due to persistent over calibration.
11	-	Misalignment detected on Top & Bottom sensors.
22	-	Elevator is stopped and is ready to run (Normal stop condition)
23	Start-up Delay In seconds	Elevator is accelerating. (xx seconds remain)
24	Speed %	Elevator running within programmed limits.
25	Speed %	Stop relay has been de-energised (Fault stop condition)
27	Time to alarm In seconds	Misalignment detected. (xx seconds to alarm)

2A	Time to alarm In seconds	Over speeding: Alarm relay about to de-energise (xx seconds to alarm)
2D	-	Misalignment detected at the top of the elevator.
2F	Time to stop In seconds	Over speeding: Stop relay about to de-energise (xx seconds to stop)
31	-	Speed display is over range: check the scaling factor.
32	-	Start elevator to commence calibration procedure.
36	1-4	Watchdog has detected an internal fault.
39	Time to alarm In seconds	Belt slipping. (xx seconds to alarm)
3A	Time to stop In seconds	Belt slipping: Stop relay about to de-energise. (xx seconds to stop)
3B	-	Elevator stopped due to lack of acceleration.
3C	Time to stop In seconds	Persistent alarm. (xx seconds to alarm)
3D	-	Elevator stopped: Speed has exceeded over speed limit.
3E	-	Interlock signal off, waiting for zero speed.
3F	-	Elevator stopped: Persistent alarm condition.
40	-	Elevator stopped: Severe under speed.
41	-	Watchdog is not calibrated: Please see the manual.
42	-	Misalignment detected at the bottom of the elevator.
44	-	Wrong access code used when changing setup.
46	Speed %	Elevator speed less than alarm level (slipping)
47	Speed %	Elevator speed more than alarm level (Over speeding)
49	-	Suspected open circuit or faulty PTC bearing temperature sensor.
4A	-	Suspected fault on one or more MAS. Could be mains pickup.
4E	-	Plug switch is open.
50	-	PTC Hot bearing at zone 1.
51	-	PTC Hot bearing at zone 2.
52	-	PTC Hot bearing at zone 3.
53	-	PTC Hot bearing at zone 4.
54	-	PTC Hot bearing at zone 5.
55	-	PTC Hot bearing at zone 6.
56	-	HBS is open circuit at zone 1
57	-	HBS is open circuit at zone 2
58	-	HBS is open circuit at zone 3
59	-	HBS is open circuit at zone 4
5A	-	HBS is open circuit at zone 5
5B	-	HBS is open circuit at zone 6

An example of the status code might be ‘2463’. The first status byte (byte 5) ‘24’ show that the equipment is running within the specified alarm limits and the second status byte (byte 4) ‘63’ indicate that the speed is 99% if it’s calibrated value. Where a value is not

shown or a '-'is used in the table, this indicates that any data present in this field should be ignored.

Several different conditions may occur at the same time whilst the Watchdog is operating. If the Watchdog is running within calibrated range but also detects a motion sensor fault then the information returned may look something like this.

'2463' Running at 99% of calibrated speed.
Followed three seconds later by
2D--' Misalignment detected at the top of the elevator.
Followed three seconds later by
'3CAA' Persistent alarm, 170 seconds to go.
The messages would then repeat with any new values in the status data field.

Due to some limitations in the speeds involved in updating the Watchdog information, rapid changed of data could be missed or be present for only a very short period of time.

If the Watchdog is placed in one of the two test modes, the messages below will be returned in the following order.

Bytes 3 and 2	Bytes 5 and 4	The first two bytes show the speed data and the second two bytes show the status and status data.
xx & xx	06 & xx	Over speed Stop as a percentage of calibrated speed.
xx & xx	05 & xx	Over speed Alarm as a percentage of calibrated speed.
xx & xx	02 & xx	The actual calibrated speed
xx & xx	03 & xx	Under speed Alarm as a percentage of calibrated speed.
xx & xx	04 & xx	Under speed Stop as a percentage of calibrated speed.
-----	07 & --	Performing internal test.
----	4C & --	Testing the Alarm relay.
----	4D & --	Testing the Stop relay.

Codes 4C and 4D are only returned if the extended test is in operation.

Under speed alarm and stop in % (Byte 7, 6)
These two bytes show (in % of calibrated speed) the under speed alarm and stop levels. These represent the point at which the Watchdog will generate an alarm or stop condition. Example, if byte 7 is '0A' and byte 6 is '14' then this means that the Watchdog will generate an under speed alarm at 10% (0A) below calibrated speed and will generate a stop condition at 20% (14) below the calibrated speed.

Over speed alarm and stop in % (Byte 9, 8)
These two bytes show (in % of calibrated speed) the over speed alarm and stop levels. These represent the point at which the Watchdog will generate an alarm or stop condition. Example, if byte 7 is '0A' and byte 6 is '14' then this means that the Watchdog will generate an over speed alarm at 10% (0A) above calibrated speed and will generate a stop condition at 20% (14) above the calibrated speed.

Current calibration value in PPM (Byte 11, 10)
These two bytes represent the current calibration speed value in Pulses Per Minute (Default). The representation can be changed to other scaled values by using the display scaling value below. Refer to the Watchdog manual for further details about display scaling.

Display scaling factor (Byte 13, 12)
These two bytes contain a value which is used by the Watchdog to scale the information on the display into a format which represents more accurately what the elevator is doing. The default scaling factor (04B0) results in the display showing the current speed in PPM. Refer to the Watchdog manual for further details about display scaling.

NTC Temperature 1 and 2 (Byte 15, 14)
These two bytes show the actual temperature of temperature sensors 1 & 2. The values are in Dec C or Deg F according to the settings on the Watchdog. Refer to the Watchdog manual NTC section for more detail.

NTC Temperature 3 and 4 (Byte 17, 16) & NTC Temperature 5 and 6 (Byte 19, 18)
See the detail above for temperature sensors 1 and 2

NTC temperature sensor status 1 and 2 (Byte 21, 20)
These two bytes show the current status of temperature sensors number 1 & 2.
If byte 21 is 0 then sensor 1 is NORMAL
If byte 21 is 1 then the temperature of sensor 1 is HIGH so an alarm has been generated.
If byte 21 is 2 then sensor 1 may be OPEN circuit
If byte 21 is 3 then sensor 1 may be SHORT circuit

NTC temperature sensors 2 to 6 operate in an identical manner as described for sensor 1 above.

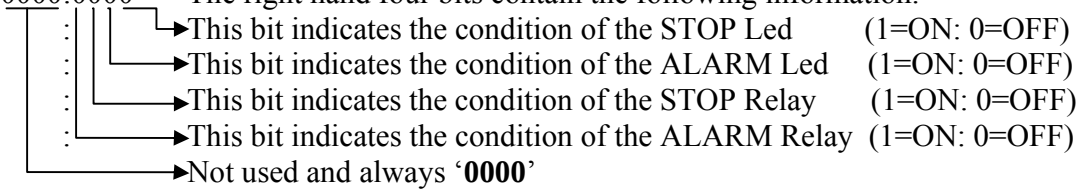
Sensor 1 and sensor 2 alarm level (Byte 27,26)
These two bytes represent the alarm value for the temperature sensor. The default values for this alarm level are '9E' (158) when measuring in Deg 'F' and '50' (80) when measuring in Deg 'C'. Refer to the Watchdog manual for further detail regarding this value.

Sensor 3 and sensor 4 alarm level (Byte 29, 28) & Sensor 5 and sensor 6 alarm level (Byte 31, 30) operate in an identical manner as described above.

Number of sensors in use (Byte 33)
Byte 33 shows the total number of NTC temperature sensors that are currently being monitored by the Watchdog. This value ranges from 0 to 6. See the watchdog manual for further detail.

Relay status (Byte 32)
This byte contains information relating to the status of the Watchdog LED's and Relays. Although the byte is represented in Hexadecimal converting it to binary helps to explain the contents a little better.

0000:0000 The left hand four bits are always **0000** and can be ignored.
0000:0000 The right hand four bits contain the following information.



When a relay is considered to be 'ON' we mean energized and when 'OFF' we mean de-energized.

0000:0000 = 00 then no conditions exist
0000:0010 = 02 then the alarm Led is on
0000:1010 = 0A then the alarm Led and Alarm Relay are active
0000:0011 = 03 then both Led's are 'on' and both Relays are 'off' (de-energized)

Persistent alarm value NTC only (Byte 35)
This is how long the temperature alarm will take in seconds before stopping the elevator. The default value is 'B4' 180 seconds. If this value reaches '0' then the elevator will be stopped.

Update counter (Byte 34)
Every time the F500 successfully receives information from the chosen watchdog, then this counter value will be incremented by 1. The watchdog treats serial communications as low priority so occasionally requests for data can be ignored. It is advisable to keep checking this value so as to know when new data has arrived in the F500. The counter will increment from 0 to 255 and then return to 0 again in a continuous loop.

Below is an example of the data returned when the F500 is polling Watchdogs

WDF500.mbp

Tx = 491: Err = 0: ID = 1: F = 03: SR = 500ms

	Alias	00000	Alias	00010	Alias	00020	Alias	00030	Alias	00040	Alias	00050
0	No.Of WD	0x0100	ST1/ST2	0x0000	USA/USS	0x0A14	ALM1/ALM2	0x9E9E	Scale Factor	0x04B0	NOS/REL	0x0103
1	WD1 Speed	0x0000	ST3/ST4	0x0000	OSA/OSS	0x0A14	ALM3/ALM4	0x9E9E	T1/T2	0x6C4F	PERALM/CNT	0x004B
2	Status	0x0000	ST5/ST6	0x0000	Calibration P...	0x0475	ALM5/ALM6	0x9E9E	T3/T4	0x42C2	WD4 Speed	0x0000
3	USA/USS	0x0000	ALM1/ALM2	0x0000	Scale Factor	0x04B0	NOS/REL	0x0208	T5/T6	0x11AA	Status	0x0000
4	OSA/OSS	0x0000	ALM3/ALM4	0x0000	T1/T2	0x4C50	PERALM/CNT	0xB49C	ST1/ST2	0x0200	USA/USS	0x0000
5	Calibration PPM	0x0000	ALM5/ALM6	0x0000	T3/T4	0x3000	WD3 Speed	0x0000	ST3/ST4	0x0000	OSA/OSS	0x0000
6	Scale Factor	0x0000	NOS/REL	0x0000	T5/T6	0x4158	Status	0x4100	ST5/ST6	0x0000	Calibration PPM	0x0000
7	T1/T2	0x0000	PERALM/CNT	0x0000	ST1/ST2	0x0000	USA/USS	0x0A14	ALM1/ALM2	0x0045	Scale Factor	0x0000
8	T3/T4	0x0000	WD2 Speed	0x0484	ST3/ST4	0x0000	OSA/OSS	0x0A14	ALM3/ALM4	0x20D6	T1/T2	0x0000
9	T5/T6	0x0000	Status	0x2465	ST5/ST6	0x0000	Calibration PPM	0xFF19	ALM5/ALM6	0x8B4B	T3/T4	0x0000

Words 1 to 17 (pink) represent Watchdog 1. These are currently all 0 because watchdog 1 isn't present at this time. Words 18 to 34 (green) represent Watchdog 2. Word 18

which is 0484 HEX tells us that the Watchdog is currently running at 1156 pulses per minutes. Word 19 which is 2465 HEX tells us that the Watchdog is 'running (24) at 101% (65) of the calibrated speed. The remainder of the information in the example can be decoded using the information as previously described. Words 35 to 51 (blue) represent Watchdog 3. Word 35 which is 0000 HEX tells us that the Watchdog is currently NOT running. Word 36 which is 4100 HEX tells us that the Watchdog is in fact NOT calibrated (41), see the Watchdog manual for more detail about calibration.

Diagnostics Display.

The F500 Elite is equipped with a simple RS232 serial interface. This interface can be used to monitor the communications with the Watchdog Elite. The information displayed contains diagnostic data about the Fieldbus module and Watchdog number 1. A VT100 or compatible display terminal should be used to display the information.

```
F500 Elite Communications Gateway - Watchdog NTC
Elite Software Version - 3.2.0

CBU Version= 1.00
API Version= 2.16
FBI Version= 1.05
ABI Version= 1.05
FieldBus Type = ModBus RTU
S2468E

DATA ARRAY FOR WATCHDOG NUMBER 1
   Speed 0423        ST1/ST2  0000
  Status 2464        ST3/ST4  0000
 USA/USS 0A14        ST5/ST6  0000
 OSA/OSS 0A14      ALM1/ALM2  9E9E
   Calib 0423      ALM3/ALM4  9E9E
 Scaling 04B0      ALM5/ALM6  9E9E
   T1/T2 605E        NOS/REL  022C
   T3/T4 3040      P-ALM/CNT  3CB1_
   T5/T6 A93A

Total Watchdogs Read = 1
```

Above is an ***example*** screen image from the diagnostics display. The information displayed will vary slightly dependent upon the fieldbus interface used.

CBU Version = X.XX – This is the control base unit software version.
API Version = X.XX – This is the application interface software version.
FBI Version = X.XX – This is the Fieldbus interface software version.
ABI Version = X.XX – This is the AnyBus interface software version.

Fieldbus type = Modbus RTU – This describes the type of Fieldbus module which is installed in the F500 Elite. If the Fieldbus module is faulty some or all of this data will change to suggest which area may be at fault. For example, FBI version number might

become 245.55. An unusually large number such as this is not usually associated with a normally functioning module and would suggest that the Fieldbus interface controller has failed. In the event of this or any other fault, contact your supplier.

The sequence S2468E indicated that the system has initialised correctly, a deviation from this indicates that one or more parts of the initialisation process has failed. If this is the case, recycle power and see if this clears the problem. If you still have problems with the initialisation of the unit contact your supplier and tell them what you see on the diagnostics display. The main area of the display shows the complete data from Watchdog address number 1 as described on pages 8 to 13 of this manual.

Diagnostics LED.

Located on the main circuit board, just above the RS485 connections to the Watchdog you will find an LED indicator (usually RED). This indicator will flash every time the F500 attempts to communicate with the Watchdogs. The LED will normally flash at a consistent rate followed by a very short pause. The short pause indicates that the F500 is updating the information which it stores internally. A significant deviation from this sequence is an indication that there is a problem. If this happens, contact your supplier for further information.

CHECK LIST
For problems after initial start-up

1. Is there excessive interference on the electrical power supply? Power conditioners and surge (spike) suppressor may have to be fitted.

2. Has the wiring for the Watchdog and Fieldbus been routed away from power cables?

3. Is the F500 Elite circuit properly grounded?

4. Is the Micro-processor control unit overheating, if so mount in temperature-controlled environment of maximum temperature 104°F (40°C).

5. Check that high powered 'Walkie Talkie' radios are not operated immediately near the control unit or Watchdogs as this will affect the performance.

6. Check that the communications/power cable is connected correctly and in accordance with DRG A,B,C and E.

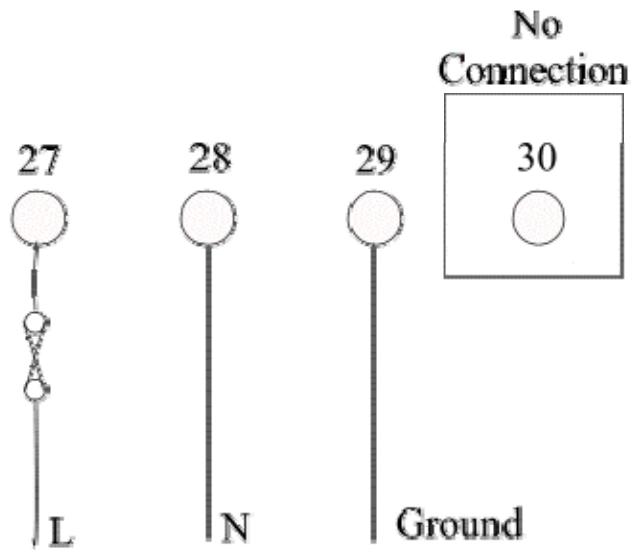
7. Check that there is no exception status reported.

8. If only part of the diagnostics data is displayed on the terminal screen then turn the F500 Elite off then back on again without removing power to the display terminal.

9. If the Watchdogs are not responding or are intermittent, check that the termination resistors are correctly fitted.

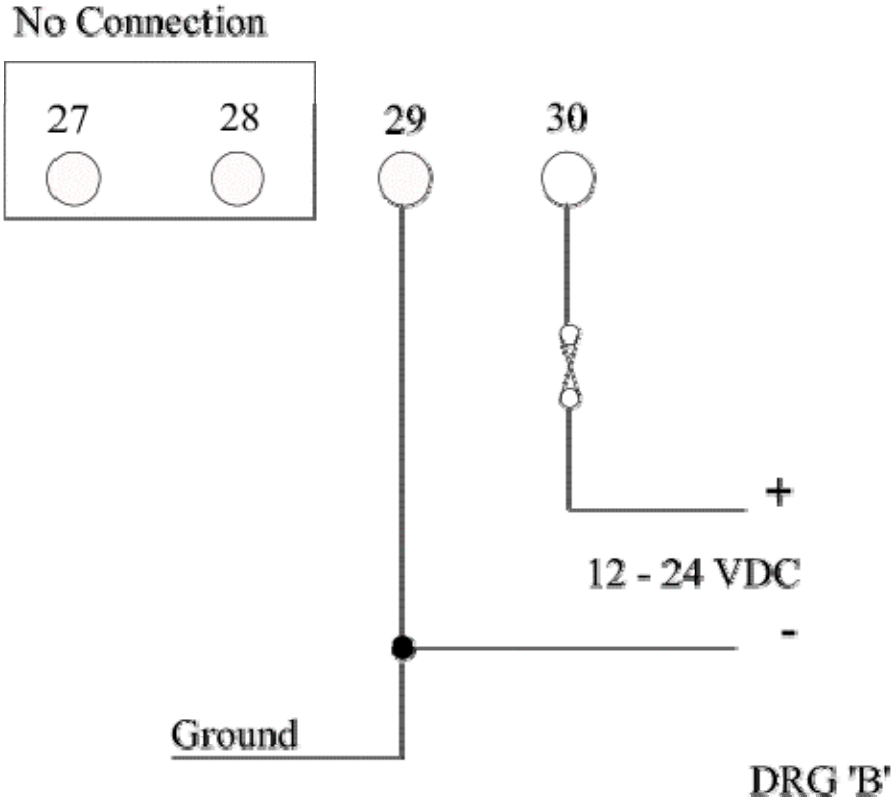
CONTACT INFORMATION

WWW.GO4B.COM



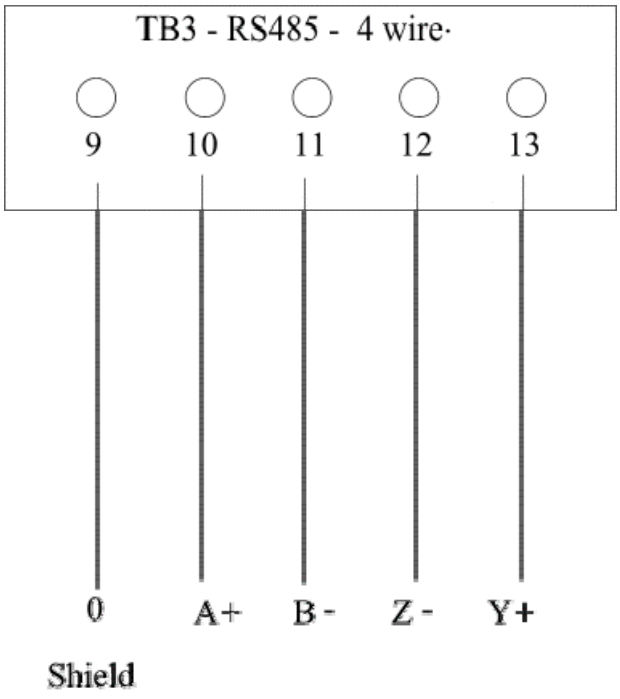
115 - 240 VAC 50/60 Hz

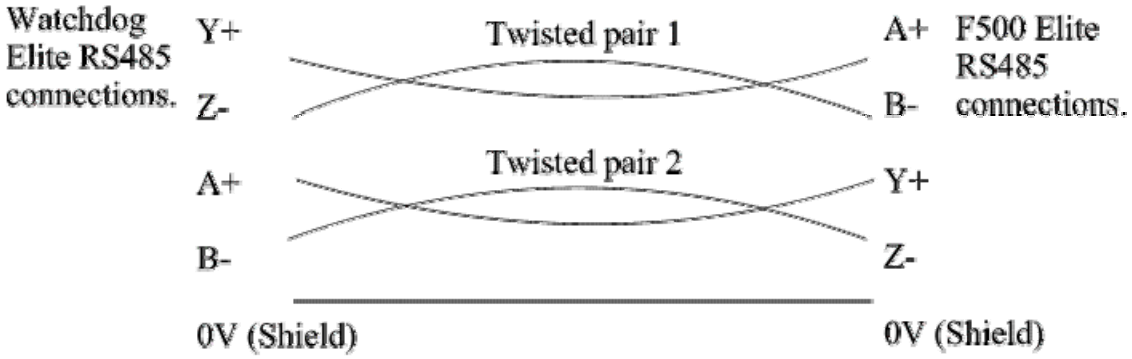
DRG 'A'



DRG 'B'

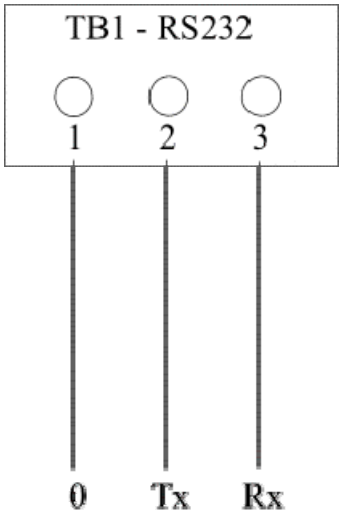
F500 elite to Watchdog connections

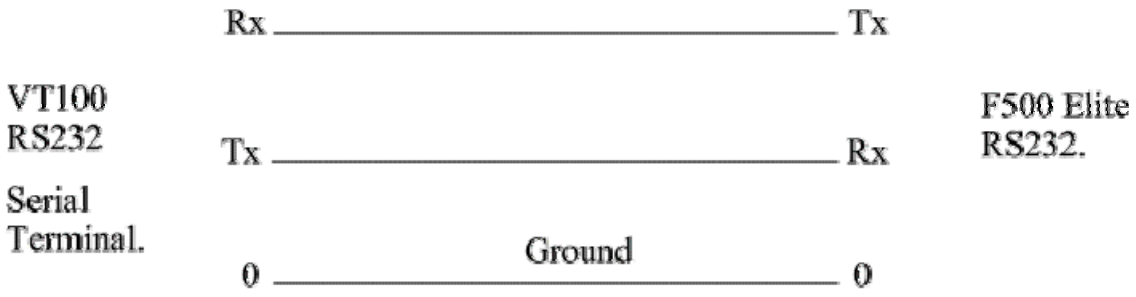




DRG 'C"

F500 elite to VT100 terminal connections.



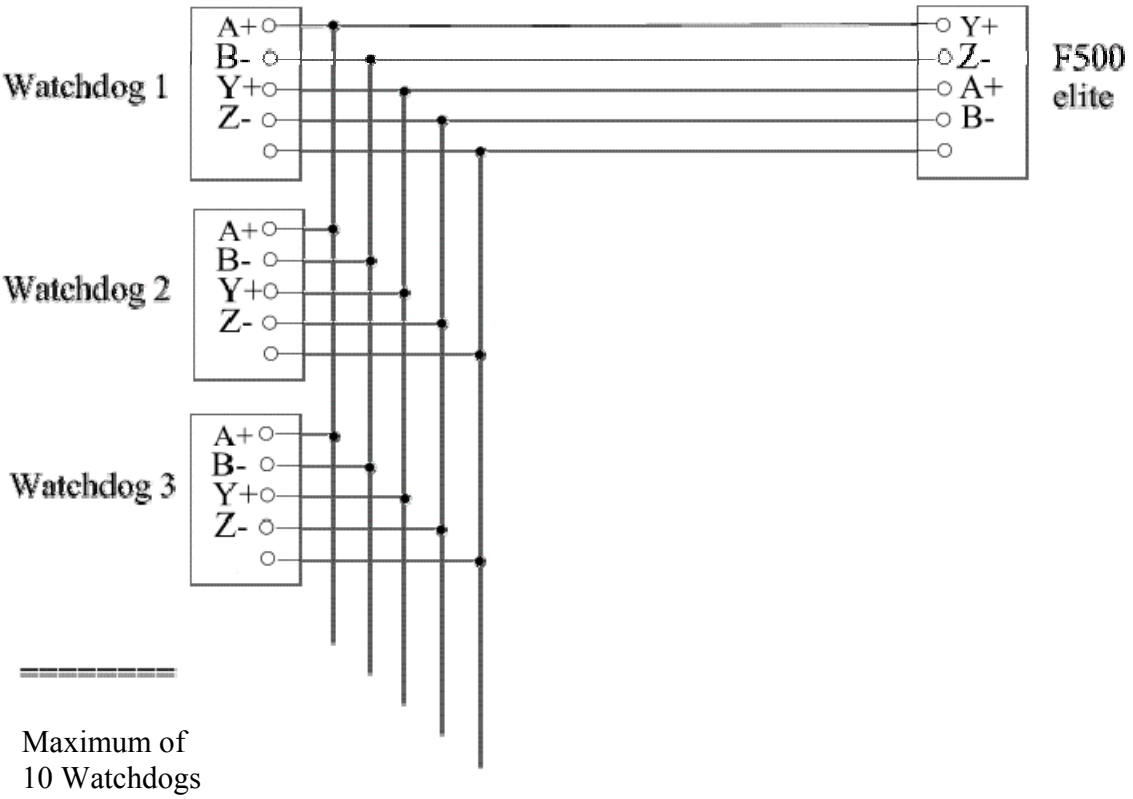


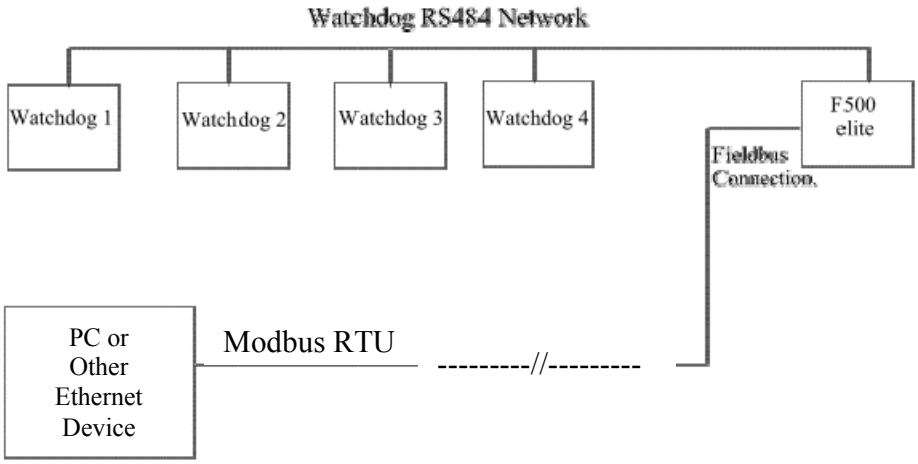
On more recent versions of the F500 TB1 may be a standard 9 pin Dee connector. This Dee connector is designed to work with a standard 9 pin to 9 pin serial lead for monitoring the F500

DRG 'D'

Connect 120 OHM ½ watt resistors between A+ and B- and between

General connection detail for the Watchdog to an F500 elite.





DRG 'E'

Appendix ‘A’

Modus RTU address switch table. 1234567 (SW1 is MSB – SW7 is LSB)

001	0000001	033	0100001	065	1000001	097	1100001
002	0000010	034	0100010	066	1000010	098	1100010
003	0000011	035	0100011	067	1000011	099	1100011
004	0000100	036	0100100	068	1000100	100	1100100
005	0000101	037	0100101	069	1000101	101	1100101
006	0000110	038	0100110	070	1000110	102	1100110
007	0000111	039	0100111	071	1000111	103	1100111
008	0001000	040	0101000	072	1001000	104	1101000
009	0001001	041	0101001	073	1001001	105	1101001
010	0001010	042	0101010	074	1001010	106	1101010
011	0001011	043	0101011	075	1001011	107	1101011
012	0001100	044	0101100	076	1001100	108	1101100
013	0001101	045	0101101	077	1001101	109	1101101
014	0001110	046	0101110	078	1001110	110	1101110
015	0001111	047	0101111	079	1001111	111	1101111
016	0010000	048	0110000	080	1010000	112	1110000
017	0010001	049	0110001	081	1010001	113	1110001
018	0010010	050	0110010	082	1010010	114	1110010
019	0010011	051	0110011	083	1010011	115	1110011
020	0010100	052	0110100	084	1010100	116	1110100
021	0010101	053	0110101	085	1010101	117	1110101
022	0010110	054	0110110	086	1010110	118	1110110
023	0010111	055	0110111	087	1010111	119	1110111
024	0011000	056	0111000	088	1011000	120	1111000
025	0011001	057	0111001	089	1011001	121	1111001
026	0011010	058	0111010	090	1011010	122	1111010
027	0011011	059	0111011	091	1011011	123	1111011
028	0011100	060	0111100	092	1011100	124	1111100
029	0011101	061	0111101	093	1011101	125	1111101
030	0011110	062	0111110	094	1011110	126	1111110
031	0011111	063	0111111	095	1011111	127	1111111
032	0100000	064	1000000	096	1100000		

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