



# **F500 Elite.**

## **FIELDBUS ADAPTER.**

### **T500 Elite to Ethernet/Modbus TCP/IP communications.**

**(Software Version 1.4.1)**

**Approvals: Suitable for use in Hazardous Locations**

**CE Ex II 3D T125°C**

**CL II Div 1 GPS E, F & G (CANADA ONLY)**

**CL II Div 2 GPS F & G (USA ONLY)**

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# **F500 FIELDBUS ADAPTER.**

## **INTRODUCTION**

This version of the F500 Elite Fieldbus adapter had been designed to work as a T500 Elite communications gateway and has been designed specifically to allow up to 4 x T500 control units running software version 2.3.4 and above, to be networked together through their own built in communications system. The network data can then be passed through the Fieldbus adapter to an Ethernet/Modbus TCP/IP network. The communications control unit is housed in a self-contained wall-mounting enclosure, and will operate from 100v to 240v AC or 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 (F5004V46CAI) –	115 to 230VAC +/- 10% 50/60Hz
(F5004V4CAI) -	24VDC +/- 10%
Power Consumption -	12VA/12 WATTS
Terminals -	Power 4mm <sup>2</sup> 14 AWG max
-	Communications, as appropriate to the Fieldbus module.
Protection -	NEMA12, IP66
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 1 1/8" DIA, 28mm, 3/4" CONDUIT
Weight -	3lbs, 1.3Kg

## 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 ELECTRICAL 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 no user configurable options with the exception of the Ethernet IP address. The adapter is equipped with two communications ports; RS485 and Ethernet TCP/IP.

The RS485 port is a four wire, twin twisted pair full duplex serial port and has been specifically configured to work with the T500. You should not connect any other devices to this port

The Ethernet port meets the requirements of the 10/100Base-T twisted pair Ethernet physical layer. Although the Ethernet Fieldbus adapter module is designed for use with the general form of the TCP/IP communications model, it has been specifically configured to work with Ethernet/Modbus TCP/IP. The Fieldbus module should be connected through a standard Ethernet communications hub. Alternatively, a peer to peer connection could be made using a single crossover or uplink cable. The Fieldbus Ethernet module will support up to 16 simultaneous Ethernet TCP connections. The default configurations used by the Fieldbus module are as follows.

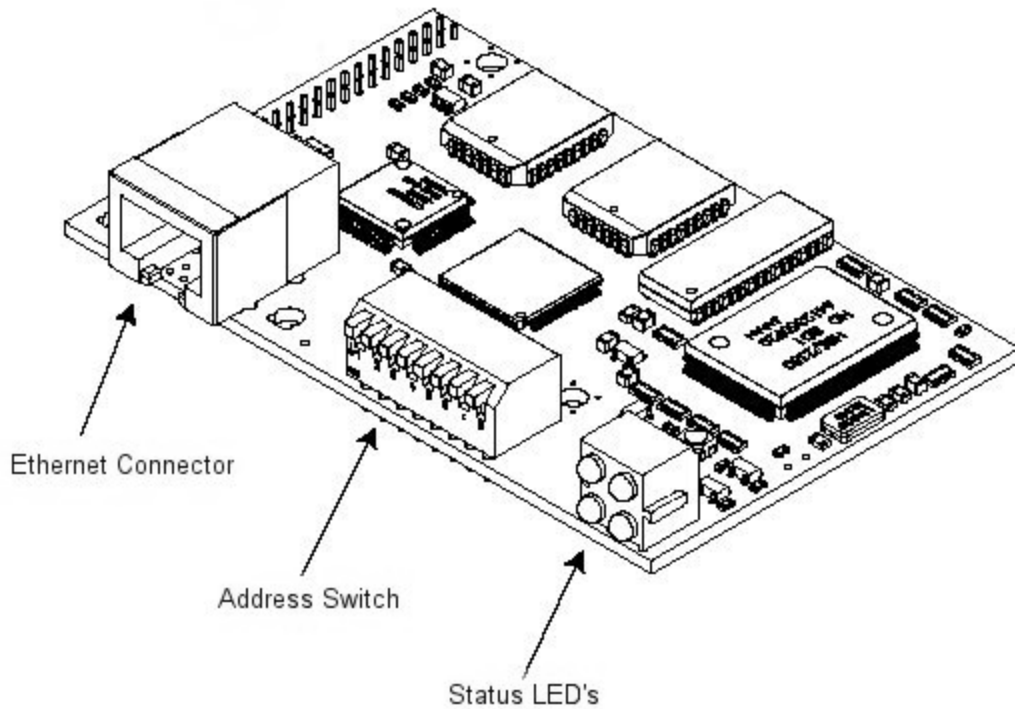
IP Address. 192.168.0.X  
Port = 502

This module is currently configured for use as part of an intranet network only therefore further settings are not required. By default, the following settings are also applied.

Subnet address 255.255.255.0, Gateway Address 0.0.0.0.

These settings can be ignored as they are only useful when connecting to an internet network.

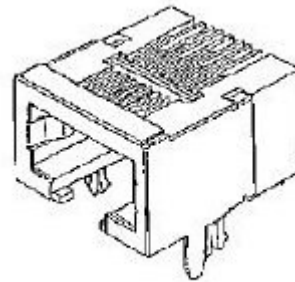
The last byte of the IP address “X” refers to the settings made on the switches located on the Ethernet module. The switch block contains 8 switches which represent the last 255 addresses of the IP address 192.168.0.1-255. The rightmost switch (switch 8) is the Least Significant Bit and the leftmost switch (switch 1) is the Most Significant Bit of the address. The switch is considered on (selected) when in the down position. The F500 is supplied with a default switch setting for IP 192.168.0.100. The address of the module can be changed at any time without the need to recycle power. See Appendix A. Caution must always be exercised when working with an open unit when power is still applied.



The above diagram shows the location of the main parts of the Ethernet Fieldbus module.

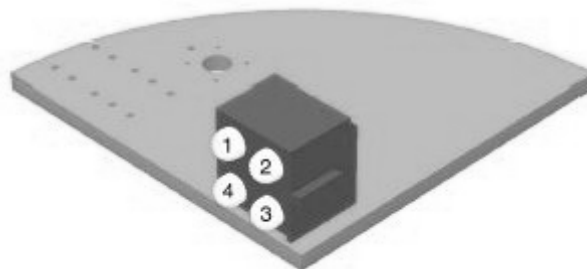
The Ethernet connections are shown below and are identical to the standard Ethernet RJ45 connections.

Connector Pin	Signal	Description.
1	TD+	Positive Transmit Data
2	TD-	Negative Transmit data
3	RD+	Positive Receive Data
4		No Connection
5		No Connection
6	RD-	Negative Receive Data
7		No Connection
8		No Connection
Casing	PE	Protective Earth



In order for the F500 to work correctly it is advisable to connect it to an Ethernet system employing a static IP address rather than a DHCP system. If the DHCP scheme is employed then it will be necessary to allocate a static address to the PC/PLC interface responsible for the data monitoring of the F500 Elite. The F500 Ethernet card can be reconfigured to comply with any IP, Subnet and Gateway configuration but as this is a difficult process we recommend that you adopt the static address method. Refer to Appendix 'B' for details of how to change the IP/Subnet/Gateway address of the F500.

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



#### Led 1 Status

Colour	Frequency	Description
Green	Steady on	Indicated that the module is connected to an Ethernet network.

#### Led 2 Status

Colour	Frequency	Description
Green	Steady on	The module is operating correctly
Green	1 Hz	The module is not yet configured (Standby) See Note 'A'
Red	1 Hz	The module has reported a minor fault.
Red	Steady on	The module has reported a major fault.
Red/Gn	Flash	Power on self test in progress.

### Led 3 Status

<i>Colour</i>	<i>Frequency</i>	<i>Description</i>
Green	Flash	At least 1 Ethernet connection has been made. See Note 'A'
Green	Steady on	No Ethernet connections have yet been made.
Red	Flash	An existing Ethernet connection has timed out. Reset the device and the F500.
Red	Steady on	The module has detected that a duplicate IP address has been used, so change the address and try again.
Red/Gn	Flash	Power on self test in progress.

NOTE 'A': Led 2 and 3 will flash together when the F500 is correctly initialised and connected to an Ethernet HUB. If Led 2 only is flashing, this indicates that the Ethernet module hasn't yet initialised and established a connection.

### Led 4 Status

<i>Colour</i>	<i>Frequency</i>	<i>Description</i>
Green	-	Flashes from green to off when a packet is received or transmitted.

### How does it all work?

The F500 is designed to monitor data for 256 sensors and 64 ambient temperatures (refer to the T500 manual for a more detailed explanation of how this number is made up). Due to limitations in the data space available the sensor table in the F500 is divided into 4 pages, each page being capable of holding data for 64 sensors and the ambient temperatures for 16 TN4(e) sensor nodes. Therefore 4 pages of 64 sensors = 256 sensors, and 4 pages of 16 ambient temperatures = 64 ambient. The F500 can be configured to operate as follows:

Blocks in T500-1	Blocks in T500-2	Blocks in T500-3	Blocks in T500-4	Total Sensors	Total Ambient
1 Sensors 1-64	0	0	0	64	16
1 Sensors 1-64	1 Sensors 1-64	0	0	128	32
1 Sensors 1-64	1 Sensors 1-64	1 Sensors 1-64	0	192	48
1 Sensors 1-64	1 Sensors 1-64	1 Sensors 1-64	1 Sensors 1-64	256	64
1 Sensors 1-64	2 Sensors 1-128	1 Sensors 1-64	0	256	64
2 Sensors 1-128	2 Sensors 1-128	0	0	256	64
2 Sensors 1-128	1 Sensors 1-64	1 Sensors 1-64	0	256	64
1 Sensors 1-64	1 Sensors 1-64	2 Sensors 1-128	0	256	64
0	1 Sensors 1-64	0	1 Sensors 1-64	128	64

0	0	1 Sensors 1-64	1 Sensors 1-64	128	64
0	0	0	1 Sensors 1-64	64	32
4 Sensors 1-256	0	0	0	256	64
0	4 Sensors 1-256	0	0	256	64
3 Sensors 1-192	1 Sensors 1-64	0	0	256	64
1 Sensors 1-64	0	3 Sensors 1-192	0	256	64
0	0	0	4 Sensors 1-256	256	64

These are a few examples of the flexible nature of the T500/F500 configuration. There is a simple rule to observe. The F500 can hold 4 blocks of data. Each T500 can supply between 1 and 4 blocks of data. There isn't sufficient room for all 16 blocks of data so you have to decide how many T500 you need to use and how many blocks of sensor data you need to monitor. If you require more than the 4 blocks of data available to the F500 then you will need to add further F500 to the system. The minimum system is 1 T500 connected to 1 F500 and monitoring 1 block of sensor data (64 sensors and 16 ambient temperatures).

The data is stored in the F500 in the following manner.

Data word	Contents
0	T500 – 1, number of active data blocks (1-4)
1	T500 – 1, Activity counter
2	T500 – 2, number of active data blocks (1-4)
3	T500 – 2, Activity counter
4	T500 – 3, number of active data blocks (1-4)
5	T500 – 3, Activity counter
6	T500 – 4, number of active data blocks (1-4)
7	T500 – 4, Activity counter
8	F500 Fault indicator (0-3)
9	Not used...
10	Block 1, first two sensors
...	
41	Block 1, last two sensors (64 sensors in total)
....	
42	Block 2, first two sensors
...	
73	Block 2, last two sensors (64 sensors in total)
....	
74	Block 3, first two sensors
...	
105	Block 3, last two sensors (64 sensors in total)
....	
106	Block 4, first two sensors
...	
138	Block 4, last two sensors (64 sensors in total)
....	
140	Block 1, first two ambient temperatures
...	
147	Block 1, last two ambient temperatures (16 in total)
...	
148	Block 2, first two ambient temperatures
...	
155	Block 2, last two ambient temperatures (16 in total)
...	
156	Block 3, first two ambient temperatures
...	
163	Block 3, last two ambient temperatures (16 in total)
...	
164	Block 4, first two ambient temperatures
...	
172	Block 4, last two ambient temperatures (16 in total)
180	T500-1 & T500-2 alarm status
181	T500-3 & T500-4 alarm status

The data is arranged in a logical order to suite each T500 connected to the interface. The data for T500 -1 is represented in the following form.

Word 0 holds the number of blocks allocated to T500 number 1 (this is done in the T500 as part of the set up procedure).

Word 1 is the activity counter for T500 number 1. Because the T500 cycle time is dependant upon the number of sensors being monitored (this can be between 1 and 8 seconds), it is important to know when the data has been refreshed. The activity counter provides this information. Providing the T500 is updating the data to the F500 this counter will increment by 1 every time new data is received by the F500. The counter will increment between 0 and 255 and it will then return back to 0 on a continuous basis. Each T500 can be assigned a unit number between 0 and 4. Assigning a 0 unit number means that the T500 will not respond to the F500 poll requests. If a number between 1 and 4 is assigned to each of the T500 connected to the F500 then each T500 will provide data in a manner described above. Care must be taken when assigning the T500 a unit number as duplication of numbers will cause confusion of the data stored in the F500. It is not necessary to connect all four T500 units to the F500 in order for it to work. A single T500 assigned as unit 1 will work equally well.

Each T500 has two words of data associated with it in an identical manner to that described for T500-1 above; please refer to the table on page 8 for T500-2 to T500-4.

The data is stored in the blocks in numerical order, which means that sensor 1 is stored first and sensor 64 is stores last. If T500-1 is configured to operate with two blocks then the data is stored like this

10	Block 1, first two sensors (T500-1 sensors 1 & 2)
...	
41	Block 1, last two sensors (T500-1 sensors 63 & 64)
....	
42	Block 2, first two sensors (T500-1 sensors 65 & 66)
...	
73	Block 2, last two sensors (T500-1 sensors 127 & 128)

If T500-2 is also configured to operate with two blocks then the data is stored like this

74	Block 3, first two sensors (T500-2 sensors 1 & 2)
...	
105	Block 3, last two sensors (T500-2 sensors 63 & 64)
....	
106	Block 4, first two sensors (T500-2 sensors 65 & 66)
...	
138	Block 4, last two sensors (T500-2 sensors 127 & 128)

The same can be said for the ambient temperature sensors.

Allocation of data can become complex to understand but essentially each new block starts where the previous block finishes irrespective of which T500 the data comes from. Sensor numbers always start at 1 and work upwards for example: If 1 block is allocated to T500-1 the sensor data is for sensors 1-64. If T500-2 is also allocated 1 block then it too will send data for sensors 1-64. If T500-1 and T500-2 are both assigned two blocks each then they will each send data for sensor 1-128 (4 blocks in total and 256 sensors in total). Please refer to page 7 and 8 in this manual for further detail of block allocation.

The sensor data is presented as Hexadecimal (\$) in 16 bit words. Each word contains two 8 bit sensor values or ambient temperatures. Each value represents the most recent update for that sensor or node. It can be seen from the description on page 7 that it is necessary to further decode the data words in order to extract individual sensor values.

Using this format data can be read from the F500 either in a single large block, by smaller blocks or by single data words.

### **NTC Temperature sensors**

Positive temperatures values are between \$0°C and \$6E°C. Negative temperature values are represented by numbers between \$7F and \$96. To calculate negative temperatures subtract \$7F from the value and the result is a negative temperature between -\$0°C and -\$1F°C (e.g. \$8A – \$7F = -\$0B°C). If the value is \$EE then this represents an open circuit sensor. If the Value is \$FE this represents a sensor which is above the calibrated range and if the value is \$FF then this represents a short circuit sensor.

### **PTC Temperature sensors**

As the PTC sensor types can only be represented as NORMAL or HOT, there is only need to provide two values to indicate the state of the sensor. If the value is \$F0 then the sensor is NORMAL and if the value is \$F1, then the sensor is HOT.

### **CNT (Contact) Sensors**

As the CNT sensor types can only be represented as OPEN or CLOSED, there is only need to provide two values to indicate the state of the sensor. If the value is \$FA then the contact is OPEN and if the value is \$FB, then the contact is CLOSED.

### **Ambient Temperatures**

See the details for the NTC Temperature Sensor above.

The ambient temperatures are taken from a sensor located on each TN4(e) sensor node.

### **Communications Errors**

If the T500 fails to communicate correctly with the TN4(e) node then it will report a communications error and the F500 will mirror this error by sending the code \$EF.

### **Unallocated sensors**

Sensors which have not been programmed into the T500 will present the code \$FD.

Below is a table showing a complete list of the data represented in the F500

<u>Decimal</u>	<u>Hex</u>	<u>Description</u>
0 – 110	\$00– \$6E	NTC Temperature 0°C to 110°C
127 – 158	\$7F– \$9E	NTC Temperature -0°C to -31°C
238	\$EE	NTC open circuit sensor
239	\$EF	Communications error (lost contact with sensor node)
240	\$F0	PTC Sensor in the NORMAL state
241	\$F1	PTC Sensor in the HOT state
250	\$FA	CNT contact in the OPEN (off) state
251	\$FB	CNT contact in the CLOSED (on) state
253	\$FD	Sensor not scanned by T500 (this includes the ambient)
254	\$FE	NTC Temperature above maximum range
255	\$FF	NTC sensor is short circuit?

As the temperatures are in °C it may be necessary to convert the value to °F  
Calculate the temperature value complete with sign and call it T°C, therefore  
 $T^{\circ}\text{F} = (T^{\circ}\text{C} * 1.8) + 32$

E.g. If T°C = 20°C then T°F = (20 \* 1.8)+32 = 68°F  
If T°C = -20°C then T°F = (-20 \* 1.8) + 32 = -4°F

### **Exception Status**

Only three exception codes are generated by the module. These are only generated when one of the following occur. An attempt has been made to use a function call which is not supported by the Fieldbus module. An attempt to read input registers beyond those which have been initialised or an illegal request for data has been received by the module, for example, an attempt to read word data beyond the configured maximum. These codes are generated by the application layer of the Ethernet protocol and are not available for general reading.

### **Remote alarm acknowledge**

The F500 software version 1.3.4 and above is equipped with the ability to remotely acknowledge the T500 alarm state. The T500 can still be acknowledged locally at the T500 (see the T500 manual). As we are able to have between 1 and 4 T500 units connected to the F500 it is essential to know which T500 is generating the alarm. This is already implied by the data read from the T500 (see above) but two data words are reserved to indicate directly the state of the alarm warning condition. Words 180 and 181 are reserved for this purpose. Each word being 16 bits holds the status for two T500 alarms. Word 180 holds the status for T500-1 in the upper 8 bits and T500-2 in the lower 8 bits. Therefore, if word 180 contained \$0000, neither T500 is in alarm. If word 180 contained \$FFF0 then T500-1 is in alarm and T500-2 is not in alarm. If word 180 contains \$00FF the T500-1 has no alarms and T500-2 has an alarm. Finally if word 180 contains \$FFFF the both T500's are in alarm. The same can be applied to word 181 which relates to T500-3 and T500-4. Words 180 & 181 are read only.

So now we know which T500 is in alarm and by examining the data we can tell which sensor is generating the alarm. To complete the cycle we need to be able to acknowledge the alarm back to the T500 which generated the alarm(s). Words 1025 and 1026 are

reserved for this purpose and they operate in a very similar manner to words 180 and 181. Each word being 16 bits holds the acknowledge request for two T500 units. Word 1025 is the acknowledge request for T500-1 in the upper 8 bits and T500-2 in the lower 8 bits. Therefore, if word 1025 contained \$0000, neither T500 alarm will be acknowledged. If word 1025 contains \$FF00 then T500-1 is acknowledged and T500-2 is not. If word 1025 contains \$00FF the T500-1 has no acknowledge request and T500-2 has an acknowledge request. Finally if word 1025 contains \$FFFF the both T500's have an alarm acknowledge request in place. The same can be applied to word 1026 which relates to T500-3 and T500-4. Words 1025 and 1026 are read/write.

Once you have requested an alarm acknowledge you can monitor its progress by reading the appropriate word. For example: word 180 contains \$FF00 which means T500-1 has an alarm(s) present. Setting word 1025 to \$FF00 will tell T500-1 to cancel the alarm warning. After the T500 has done this it will reset word 180 to \$0000 thus confirming the alarm acknowledge. **At the end of the acknowledge cycle you must clear the acknowledge request to 00 (set 1025 to \$0000) or you will not be able to generate further alarm acknowledge requests for that T500.**

Therefore, the cycle goes like this:

T500-1 generates an alarm (Word 180 = \$FF00 – upper 8 bits = \$FF)

You want to acknowledge the alarm (set word 1025 to \$FF00 – upper 8 bits = \$FF)

Then keep looking at word 180 until it changes back to \$0000

Then set word 1025 to \$0000

This completes the alarm acknowledge cycle.

The T500 responds to a change in value from \$00 to \$FF and then back to \$00. If you leave the acknowledge value at \$FF the T500 will acknowledge the current alarm but further alarms can not be acknowledged remotely (but can be acknowledged locally by pressing the set key on the T500 unit).

If you request an alarm acknowledge without an alarm being present, the T500 will ignore the request. You must however clear the request register to \$00 ready for use again next time.

Because the T500 update time varies with the number of nodes attached it can take between 1 and 8 seconds to acknowledge an alarm through the F500. Average time to acknowledge is about 3 seconds (based upon a typical installation). The T500 treats the F500 as a low priority interface.

**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 F500 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 the unit in a temperature-controlled environment of maximum temperature 113°F (45°C).
5. Check that high powered 'Walkie Talkie' radios are not operated immediately near the control unit or F500 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 the T500 units are not responding or are intermittent, check that the termination resistors are correctly fitted.

## CONTACT INFORMATION



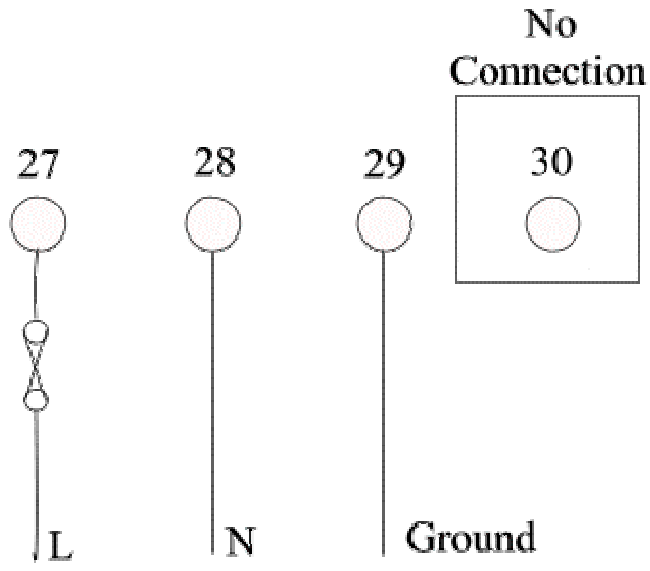
[www.go4b.com](http://www.go4b.com)

US: +01 309 698 5611

UK: +44 (0)113 246 1800

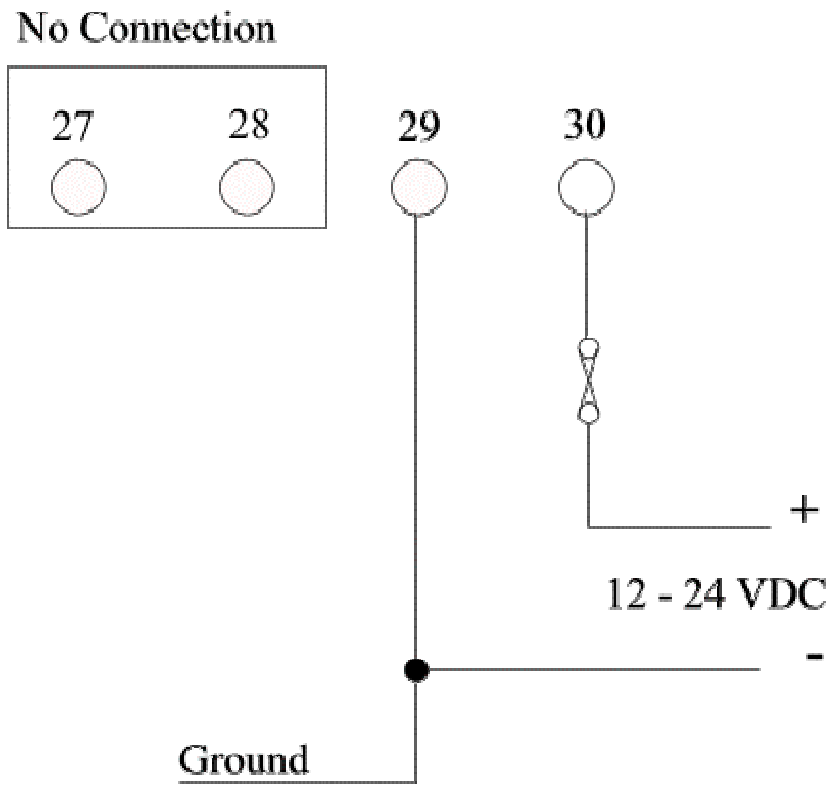
F: +33 (0)3 22 42 32 36

D: +49 (0)700 224 2491



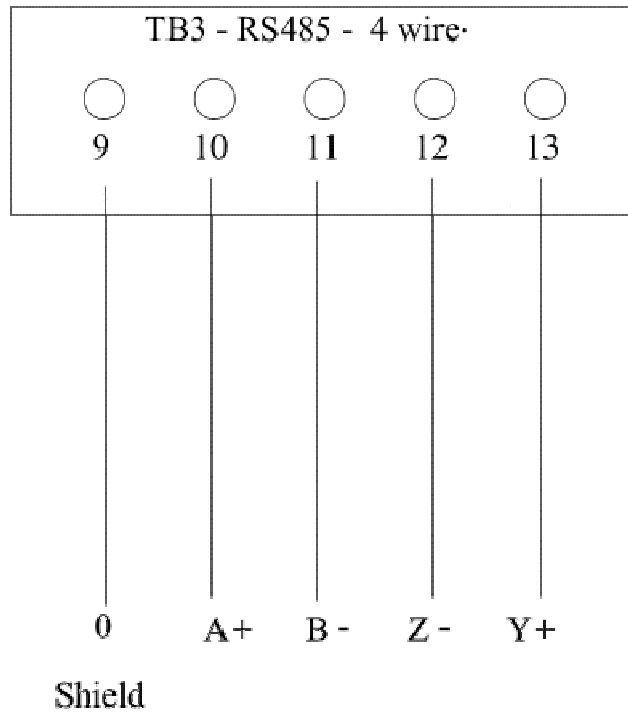
115 - 240 VAC 50/60 Hz

DRG 'A'

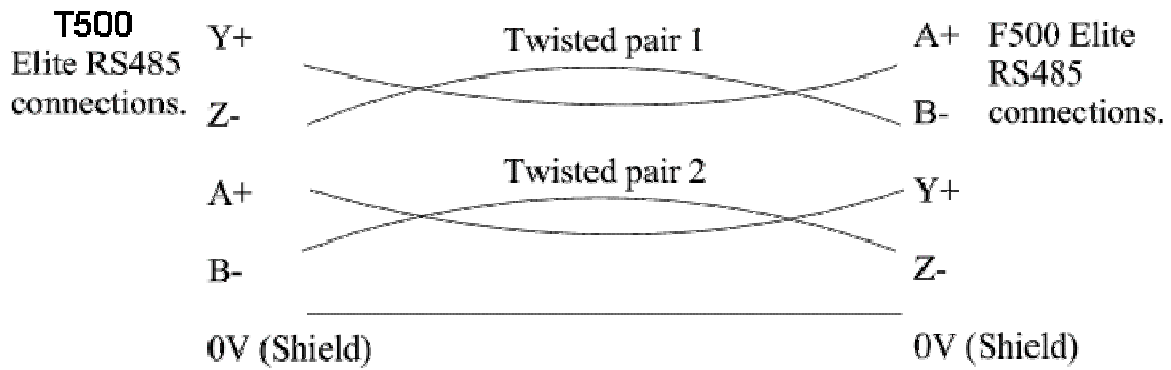


DRG 'B'

**T500 Elite to F500 Elite Connection Diagram**

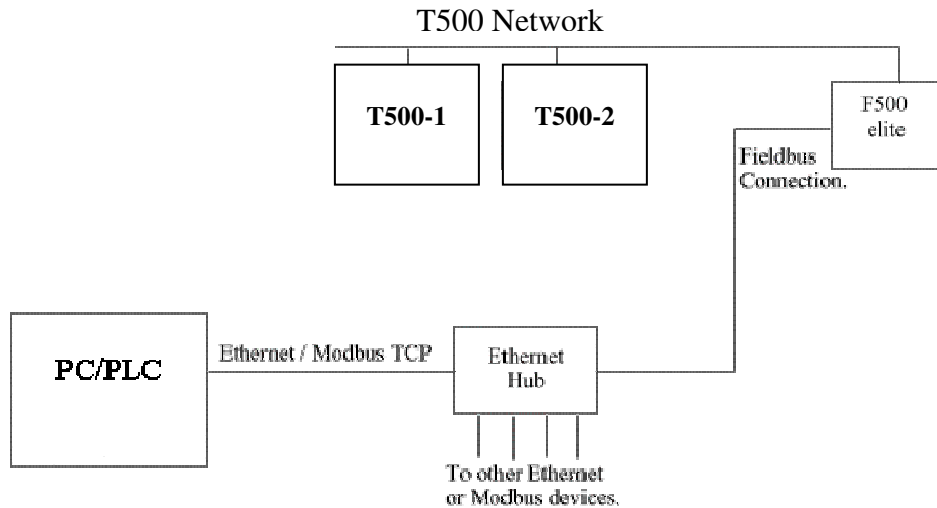
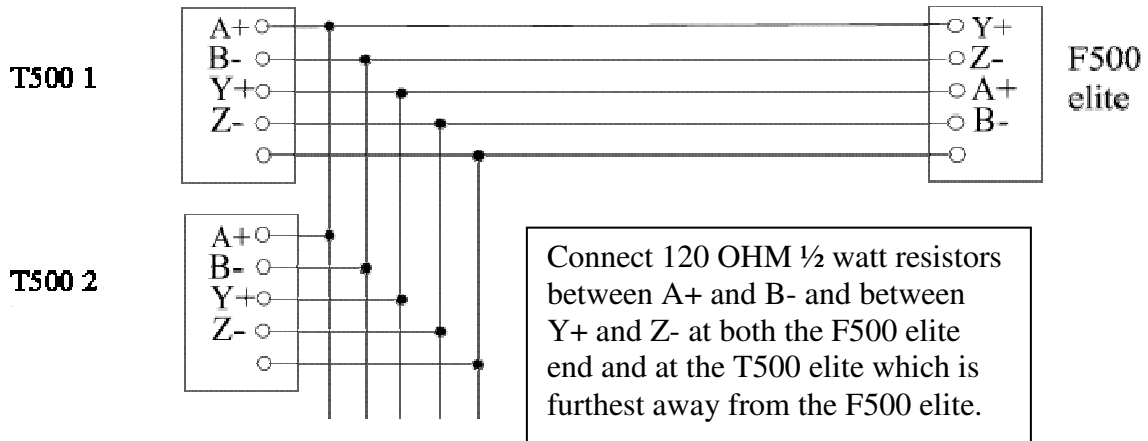


Shield



DRG 'C'

**General connection detail for the T500 Elite to F500 Elite**



**DRG 'E'**

## Appendix 'A'

The table below represents the settings for the Ethernet address switch as described on page 5. The F500 is supplied with a default IP address of 192.168.0.100. The last three numbers of the address can be changed to eliminate conflicts with existing IP address's already in use on your Ethernet system. The switches are numbered 1 to 8 left to right and switch 8 represents the lowest binary number. In the table below a '0' represents the switch in the OFF or UP position and a '1' represents the switch in the DOWN or ON position. The table is made up in the following format

ABC 12345678

Where ABC is the last part of the IP address 192.168.0.ABC and 12345678 represents the switch number from left to right.

001	00000001	033	00100001	065	01000001	097	01100001
002	00000010	034	00100010	066	01000010	098	01100010
003	00000011	035	00100011	067	01000011	099	01100011
004	00000100	036	00100100	068	01000100	100	01100100
005	00000101	037	00100101	069	01000101	101	01100101
006	00000110	038	00100110	070	01000110	102	01100110
007	00000111	039	00100111	071	01000111	103	01100111
008	00001000	040	00101000	072	01001000	104	01101000
009	00001001	041	00101001	073	01001001	105	01101001
010	00001010	042	00101010	074	01001010	106	01101010
011	00001011	043	00101011	075	01001011	107	01101011
012	00001100	044	00101100	076	01001100	108	01101100
013	00001101	045	00101101	077	01001101	109	01101101
014	00001110	046	00101110	078	01001110	110	01101110
015	00001111	047	00101111	079	01001111	111	01101111
016	00010000	048	00110000	080	01010000	112	01110000
017	00010001	049	00110001	081	01010001	113	01110001
018	00010010	050	00110010	082	01010010	114	01110010
019	00010011	051	00110011	083	01010011	115	01110011
020	00010100	052	00110100	084	01010100	116	01110100
021	00010101	053	00110101	085	01010101	117	01110101
022	00010110	054	00110110	086	01010110	118	01110110
023	00010111	055	00110111	087	01010111	119	01110111
024	00011000	056	00111000	088	01011000	120	01111000
025	00011001	057	00111001	089	01011001	121	01111001
026	00011010	058	00111010	090	01011010	122	01111010
027	00011011	059	00111011	091	01011011	123	01111011
028	00011100	060	00111100	092	01011100	124	01111100
029	00011101	061	00111101	093	01011101	125	01111101
030	00011110	062	00111110	094	01011110	126	01111110
031	00011111	063	00111111	095	01011111	127	01111111
032	00100000	064	01000000	096	01100000	128	10000000

129	10000001	161	10100001	193	11000001	225	11100001
130	10000010	162	10100010	194	11000010	226	11100010
131	10000011	163	10100011	195	11000011	227	11100011
132	10000100	164	10100100	196	11000100	228	11100100
133	10000101	165	10100101	197	11000101	229	11100101
134	10000110	166	10100110	198	11000110	230	11100110
135	10000111	167	10100111	199	11000111	231	11100111
136	10001000	168	10101000	200	11001000	232	11101000
137	10001001	169	10101001	201	11001001	233	11101001
138	10001010	170	10101010	202	11001010	234	11101010
139	10001011	171	10101011	203	11001011	235	11101011
140	10001100	172	10101100	204	11001100	236	11101100
141	10001101	173	10101101	205	11001101	237	11101101
142	10001110	174	10101110	206	11001110	238	11101110
143	10001111	175	10101111	207	11001111	239	11101111
144	10010000	176	10110000	208	11010000	240	11110000
145	10010001	177	10110001	209	11010001	241	11110001
146	10010010	178	10110010	210	11010010	242	11110010
147	10010011	179	10110011	211	11010011	243	11110011
148	10010100	180	10110100	212	11010100	244	11110100
149	10010101	181	10110101	213	11010101	245	11110101
150	10010110	182	10110110	214	11010110	246	11110110
151	10010111	183	10110111	215	11010111	247	11110111
152	10011000	184	10111000	216	11011000	248	11111000
153	10011001	185	10111001	217	11011001	249	11111001
154	10011010	186	10111010	218	11011010	250	11111010
155	10011011	187	10111011	219	11011011	251	11111011
156	10011100	188	10111100	220	11011100	252	11111100
157	10011101	189	10111101	221	11011101	253	11111101
158	10011110	190	10111110	222	11011110	254	11111110
159	10011111	191	10111111	223	11011111	255	11111111
160	10100000	192	11000000	224	11100000		

The entry in the table above which has a grey background represents the default switch settings.

## Appendix 'B'

The F500 Elite Ethernet interface is preconfigured to operate with an IP address of 192.168.0.100. This is acceptable in most instances. We recommend that you use static IP address allocation in order to minimize difficulty with address conflict. Please refer to your system supplier or maintenance department for details of how to add or change a static IP address for your Ethernet system.

Below is a method by which you can change the IP, Subnet and Gateway addresses for the F500 Ethernet interface. This method requires advanced knowledge of this type of procedure and it is not recommended that you use it unless you are familiar with the requirements.

The reconfiguration process must be done on one of the computers that will be connected to the F500 in order for it to work correctly. It is assumed that the hardware is all connected and powered up.

Assuming that the computer IP address is 182.169.106.3 and the subnet mask is 255.255.255.0, it is possible to reconfigure the F500 Ethernet module to 182.169.106.XXX. If the subnet mask isn't as described above then this method will not work.

Before making any changes you must do the following.

Open as DOS box (DOS prompt) on the PC in question.

At the DOS prompt type '**telnet 192.168.0.100**' (without the quotes) press enter (this is the existing IP address for the F500) and you should see the following prompt appear-

```
HMS AnyBus-S Ethernet module  
Admin mode, no login required  
\>
```

At the prompt type '**version**' and press enter. You should then see something similar to that shown below.

```
HMS AnyBus-S Ethernet module
```

```
Software version: 1.13.01  
Bootloader version: 1.11.01  
Serial number: 0xA000EE60  
MAC address: 00-30-11-02-07-6F  
FB type: 0x0083
```

The information that you need is the MAC address so write this down exactly as you see it. Then type '**exit**' and you should see...

```
Connection to host lost.  
Press any key to continue...
```

And then you should be back to your original dos prompt.

Set all of the F500 switches to the UP position (off).

Now type the following, the [] characters is used to represent a space just to make it clearer.

Arp[]-s[]182.169.106.XXX[] followed by the MAC address that you wrote down earlier.

For example, you could type:-

**Arp[]-s[]182.169.106.100[]00-30-11-02-07-6F** then press the enter key. The last part of the IP address (100) is a randomly chosen number that doesn't conflict with any other IP address on the system. The actual address you will end up using will be set by the F500 Ethernet module switches.

Still at the dos prompt type **arp[]-a** and press enter. You should see something similar to this.

```
Interface: 182.169.106.30 --- 0x10003
Internet Address      Physical Address      Type
182.169.106.100      00-30-11-02-07-6f    static
182.169.106.3        00-40-2b-25-ed-ac    dynamic
```

What you see doesn't ready matter as long as you see your IP and MAC address as entered.

Now type **ping 182.169.106.100** and press enter.

You should now see:-

*Pinging 182.169.106.100 with 32 bytes of data:*

```
Reply from 182.169.106.100: bytes=32 time=3ms TTL=30
Reply from 182.169.106.100: bytes=32 time=1ms TTL=30
Reply from 182.169.106.100: bytes=32 time=1ms TTL=30
Reply from 182.169.106.100: bytes=32 time<1ms TTL=30
```

```
Ping statistics for 182.169.106.100:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

If you don't get this or similar as the result then you will have to repeat the cycle again.

The process is now complete. If required, you can leave the F500 module switches set to all off and you will be able to use the fixed address that you programmed (182.168.106.100 in the example) or you can set the switches according the table in Appendix 'A' of this manual if you want a different ending address.

INSTALLATION NOTES: