

COMMAND LINE INTERFACE, FREQUENTLY USED COMMANDS

COMMAND	DESCRIPTION / USE
?	Displays the system's present alarms and I/O channel status.
H[ELP]	Displays the list of all commands available in a Telnet session with a short description.

Refer to the User Manual for more commands and more detailed information.

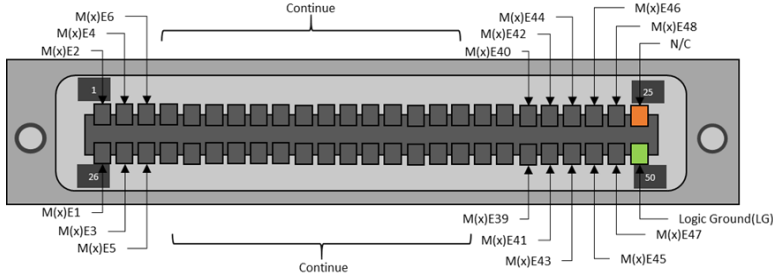
SMX MODULES

Both SMX modules share the same pin out for their respective J1-POWER and J2-MODBUS connectors. Refer to the following SMX-24AI figure for Power and MODBUS wiring. Up to 32 MODBUS modules can be network on each FUSION's EIA-485 port for a total of 64 modules. The SMX communication speed and module address are configured using the rotary switches on the front panel. The SMX "SPEED" rotary switch correspondence is as follow:

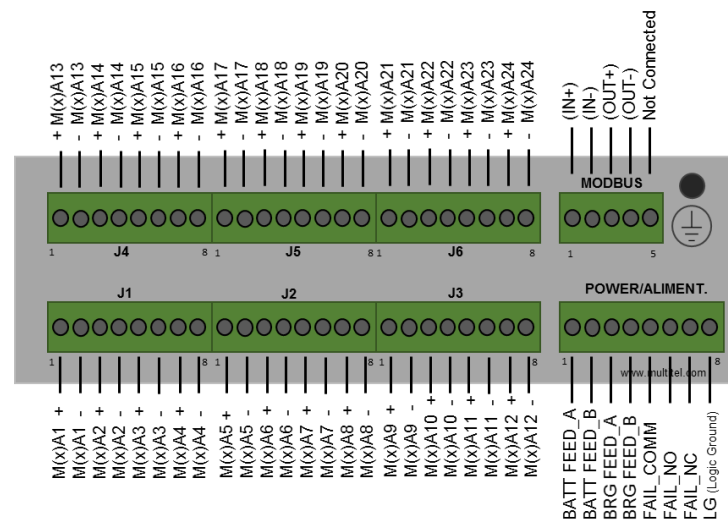
1 = 1200; 2=2400; 3=4800; 4=9600; 5=19,2k; 6=38,4k; 7=57,6k and 8=115,2k (default)

SMX-48BI

The SMX-48BI offers 48 single ended binary input on the J3- ALARM 50-pin CHAMP style connector. The below figure provide the channel and pinout cross-reference.


SMX-24AI

A scale value must be programmed for each analog input channel using the analog command. See the following table for typical values. Both SMX model's MODBUS and POWER/ALIMENT connectors share the same pinout.



FRONT END	TRANSDUCER	SCALE
0-65Vdc	Not applicable – For FUSION only	65
±65Vdc	Not applicable – For SMX-24AI only	65
0-10Vdc	For – For FUSION only	10
±10Vdc	Not applicable – For SMX only	10
10Vdc for 0-4V DC Current	DC Current Transducer (±50A)	125
	DC Current Transducer (±100A)	250
	DC Current Transducer (±250A)	625
	DC Current Transducer (±500A)	1250
23Vrms is specific for SDTA	SDTA-01 (240Vac)	2680
	SDTA-02 (240Vac / 600Vac)	2680 / 6700
1.4Vrms for 0.333mV AC Current CT	AC Current Transformer 50A	595
	AC Current Transformer 100A	1189
	AC Current Transformer 200A	2378
	AC Current Transformer 400A	4757
	AC Current Transformer 600A	7135
	AC Current Transformer 1500A	17835
Temp	Temperature Probes (M-4103, M-4107, M-4109, M-4111, M-4115)	120
	Humidity	Humidity Probe (M-4109) – FUSION F1A5 Only
± 50mVdc	50mV Shunt	Shunt value
	FCCP-01 (Float Charging Current Probe)	5

Mechanical:

Height : 4.5 cm (1.75 in)
 Depth : 25.4 cm (10 in)
 Width : 28.5 cm (11.2 in)
 Weight : 7lb (3.18kg)

Environmental:

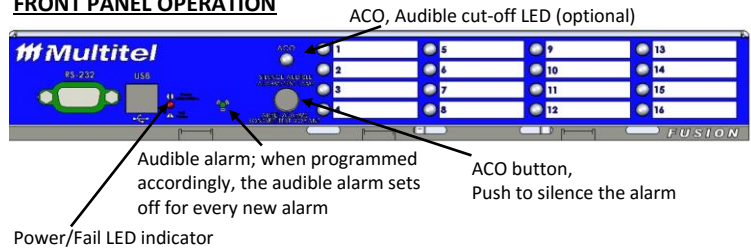
Operating Temp.: -40 to 65°C (-40°F to 149°F)
 Operating Humidity: 5 to 90%RH Non condensing
 Storage Temp.: -40°C to 70°C (-40°F to 158°F)

Electrical:

Input Voltage : - 40 to -60Vdc
 consumption : 7W typically
 Protection: 2A or 1^{1/2}A Fuse

Certifications/Homologations

FCC Part 15 Subpart B, ICES-003 and CS-03 and TIA-968
 Certified UL and CSA 60950-1 2nd edition

FRONT PANEL OPERATION


POWER / FAIL LED COLOUR	POSSIBLE CAUSE
White (OFF)	FUSION is not powered up correctly
Green	Hardware and software functional
Red	Hardware Failure
Red – flashing once	Defective Expansion I/O Card
Red – flashing twice	Problem with Front panel
Red- flashing 3 times	Low on-board lithium battery. Replace the battery
Red – flashing 4 times	Memory Problem
Red – flashing 5 times	EEPROM Problem
Red – flashing 6 times	RTC Problem (Real Time Clock)
Red – flashing 7 times	Power feed A or Power feed B Problem
Red – flashing 8 times	Optional Modem Problem
Red – flashing 9 times	Network Interface Problem
Red – flashing 10 times	Fatal Configuration Error
Red – flashing 11 times	Modbus configuration or communication problem
Red – flashing 12 times	NTP server unavailable or PID not working properly
Red – flashing 13 times	Defective Fusion I/O cards
Red – flashing 14 times	Anything other issues (not reported in the previous flashing code 1 to 13. (Ex.: Dialup bridge, Modbus Display unavailable. Etc.)

COMMUNICATION PORTS
Craft port interfaces

Use either the front RS-232 or USB port as they do not operate simultaneously. **FUSION** detects the presence of cable on each port.



Connector	RS-232 PORT	USB 2.0 PORT
	DB-9 Female	Type B Female
Cable for Laptop	Direct DB9M to DB9F	Type A to Type B Male
Default Baud Rate	115200	115200
Driver	N/A	Available on CD ROM

Network Interfaces

INTERFACE (CONN.)	USE (PROTOCOL)
M LINK (RJ-11)	<ul style="list-style-type: none"> • M LINK protocol for 1U1S and I/O cards (Up to 15 C(x)) • MODBUS protocol for SMX & 3-party modules (up to 32 M(x))
RS-485 (RJ-11)	<ul style="list-style-type: none"> • M LINK protocol for 1U1S and I/O cards (Up to 15 C(x)) • MODBUS protocol for SMX & 3-party modules (up to 32 M(x))
Rear RS-232 (DB-9F)	<ul style="list-style-type: none"> • X.25 PAD, Generator controller, HVAC system... (Terminal) • External modem, Hayes compatible (Terminal, ASCII)
Modem (RJ-11)	<ul style="list-style-type: none"> • Connection to Public Switch Telephone Network (Terminal) • The modem is optional, speed up to 56kbps
Ethernet (RJ-45) (AUTO-MDIX) 10/100BASE-T	<ul style="list-style-type: none"> • Support secure IP protocol such as HTTP, SSL, NTP, SMTP, SNMPv1, v2 and v3, IMCP (PING), TELNET, SSH, HTTP(S) Transfer, RADIUS, SYSLOG, etc.. • Online charting and graphical HMI views.

I/O CHANNELS EXPANSION CAPABILITIES

The **FUSION**'s I/O channel capacity can be expanded using:

- **SMX modules:** Two (2) different modules, the **SMX-48BI** add 48 binary inputs and the **SMX-24AI** adds 24 hybrid analog input channels. Operates on MODBUS RTU protocol over the two-wire half duplex EIA-485 port. Max of 64 SMX modules.
- **MODBUS modules:** Max of 64 Modbus RTU compatible third party devices per **FUSION**. For each module, the following I/O channels setup is available :
 - **ANALOG** input: 28 per module
 - **BINARY** output: 8 per module
 - **ANALOG** input: 16 per module
 - **ANALOG** output: 4 per module
- **SNMPget modules:** Max of 16 IP supporting devices via SNMP v1, v2c. (May require your IT specialist's support for the use of MIBs files)
 - **ANALOG** input: 16 per module
 - **BINARY** input: 16 per module
- **Expansion Cards or 1U1S:** Maximum of 30 I/O cards per **FUSION** installed in up to 10 Expansion Shelf (each support 5 I/O cards) or in single card 1U1S expansion module. Uses the same I/O cards as the Expansion Shelf. Refer to the Quick reference sheet for the 1U1S module.
 - **ANALOG** Card: 18 Analog Input Channels + 18 Virtual Channels.
 - **EVENT** Card: 48 Binary Input Channels.
 - **OUTPUT** Card: 32 FORM "A" type relay contacts.



INFORMATION FREQUENTLY NEEDED

INFORMATION NEEDED	ANSWER
FUSION system default IP address	192.168.1.1
Default TCP/IP port	23
Default user name to start a communication session	supervisor
Default password to start a communication session	No password
Default state for the Auto save mode parameter (in General System Parameters)	Disabled (setting recommended by Multitel to reduce EEPROM memory activity and therefore extend its lifespan)
Enter in configuration mode (users with SUPERVISOR access level only)	<ul style="list-style-type: none"> • HTTP interface: Config menu • Command Line Interface: type config
Proposed fuses for protection of the FUSION 's power supply wiring	<ul style="list-style-type: none"> • On line Fuse of 2A. • Telecom distribution panel 1^{1/3} A
Proposed fuses for protection of the analog input channels' wiring directly connected to non-isolated telemetry points	On line 2A
Supported web browser	IE 8 and more, Chrome, Firefox
Supported Terminal Emulation	HyperTerminal, Putty,

MAXIMUM DISTANCES BETWEEN THE TRANSDUCERS AND FUSION

TYPE OF MEASUREMENT	TRANSDUCER	CABLING AWG	MAX DISTANCE
DC Current ± 50 mV	50 mV Shunts	24,22,20 twisted pairs	100 feet
DC Voltage 0-10V or ± 10 V	-----	24,22,20 twisted pairs	250 feet
DC Voltage 0-65V or ± 65 V	-----	24,22,20 twisted pairs	250 feet
Temperature	Temperature sensor M-4107 other model avail.	24,22,20 twisted pairs	500 feet
Humidity	Use M-4109 Temp./Humidity sensor	24,22,20 twisted pairs	500 feet
AC Voltage 23Vrms	Use SDTA-01 for 120/240Vac single phase	24,22,20 twisted pairs	250 feet
AC Current 1.4Vrms	Use Current CT's with 0.333mV output signal	24,22,20 twisted pairs	100 feet
Float Charging Current	Use FCCP-01 p/n M-5601	24, 22, 20, twisted pairs	100 feet
Binary Input Channel	Use door contact, water sensor, etc...	24, 26 solid wire	2000 feet
Energy Metering (V, I, kW, PF, Hz, etc..)	Use MODBUS RTU energy Meter (2-wire, half duplex)	24,22,20 twisted pairs	600 feet

Note: Transducer models are subject to change without notice; contact Multitel for the list of available accessories.

PIN-OUT FOR DIFFERENT FUSION's EXP1, EXP2, EXP3 or EXP4 I/O CARD CONFIGURATIONS

To verify the pin-out related to your **FUSION**'s configuration, look which of the following figures matches your EXP card options. Only Figure A illustrates the whole **FUSION**'s back view; Figure B to Figure I show the connector part, J1 to J9.

