MicroTech II

Frame 4 Screw chiller air cooled ALS, water cooled PFS and WHS are managed by MicroTech II controllers.

Each refrigerant circuit is managed by a I/O board and a Driver for Alco EXV (for example ALS with 3 refrigerant circuits has 3 I/O boards and 3 Driver for EXV). For each unit there is also one board for the terminal.

Every board (of a unit) is connected to the local network μLAN™ link and one I/O board acts as master, the others I/O boards act as slaves (for example ALS with 3 refrigerant circuits is managed by 1 I/O MASTER board and 2 I/O SLAVE boards).
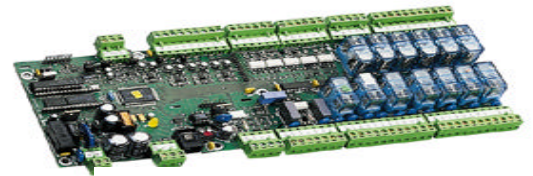
μLAN means Microprocessor Local Area Network.

It is a RS485 serial connection.

The devices connected to μLAN can share information, variables, measurements and terminals.
In this way MicroTech II becomes expandible and modularity is possible.

μLAN

Applications and functions carried out by the MicroTech II

Control section - main features:

- Management of the compressor capacity slide and fans modulation according to the distributed multiprocessor logic system (μLAN™) link system.

- Chillers enabled to work in partial failure condition thanks to the distributed multiprocessor logic system (μLAN™) link system

- Full routine operation at condition of:
    - High ambient temperature value
    - High thermal load
    - High evaporator entering water temperature (start-up)

- Display of evaporator entering/leaving water temperature

- Display of condensing-evaporating temperature and pressure, superheat temperature for each circuit

- Leaving water cooled temperature regulation (also available entering water regulation). Temperature tolerance=0,2°C
- Compressors and evaporator/condenser pumps hours counter
- Display of Status Safety Devices
- Start up numbers and compressors working hours equalization
- Excellent management of compressors load
- Fans management according to condensing pressure (ALS)
- Automatic re-start in case of power supply interruption

Safety for each refrigerant circuit
High pressure (pressure switch)
Low pressure (pressure switch)
Oil differential pressure switch
Compressor thermal
Condensation fan Magneto-thermal
High Discharge Temperature on the compressor
Phase Monitor
Star / Delta Transition Failed
Low Delta Pressure between Suction and Discharge

System security
A serious alarm input (stops the unit)
A flow controller input (stops the unit)
A pump thermal input (stops the unit)
Remote on/off input without alarm signaling

Regulation type
Proportional or proportional + integral regulation on the evaporator input probe.

Condensation
The condensation can be carried out according to temperature or pressure.
The fans can be managed according to ON/OFF mode or with a 0/10 V modulating signal.

I/O Master boards function
Temperature regulation
All compressor call
Manages the system alarms
Management of a refrigeration circuit (start, stop, alarms, EXV)
Communication possibility with an external supervisor

I/O Slave boards function
Management of a refrigeration circuit (start, stop, alarms, EXV).

Input/output list

Below the MASTER and the SLAVE (of a unit) inputs / outputs are listed as a function of the unit type; a number has been associated to each type of machine. This number is the principal parameter of the program as it identifies the input and output configuration.

Air cooled screw compressors unit   ALS

MACHINE TYPE "0"

Digital input

N	UNIT 1(Master)	UNIT 2 (Slave n. 1)	UNIT 3 (Slave n. 2)	UNIT 4 (Slave n. 3)
1	On/Off by Main Switch	On/Off by Main Switch	On/Off by Main Switch	On/Off by Main Switch
2	Evaporator flow controller (enabling)	Evaporator flow controller (enabling)	Evaporator flow controller (enabling)	Evaporator flow controller (enabling)
3	Remote On/Off	N.U. (Not Used)	N.U.	N.U.
4	Oil Level 1	Oil Level 2	Oil Level 3	Oil Level 4
5	Low pressure pressure switch 1	Low pressure pressure switch 3	Low pressure pressure switch 1	Low pressure pressure switch 3
6	Oil differential 1 (I series only)	Oil differential 2 (I series only)	Oil differential 3 (I series only)	Oil differential 4 (I series only)
7	Phase Monitor (enabling)	Phase Monitor (enabling)	Phase Monitor (enabling)	Phase Monitor (enabling)
8	Double Setpoint	N.U.	N.U.	N.U.
9	Fan Magneto-thermal 1 circ 1	Fan Magneto-thermal 1 circ 2	Fan Magneto-thermal 1 circ 3	Fan Magneto-thermal 1 circ 4
10	Failed trans. Y/Δ	Failed trans. Y/Δ	Failed trans. Y/Δ	Failed trans. Y/Δ
11	High pressure pressure switch 1	High pressure pressure switch 2	High pressure pressure switch 3	High pressure pressure switch 4
12	Compressor thermal 1	Compressor thermal 2	Compressor.thermal 3	Compressor thermal 4

Analog inputs

N	UNIT 1(Master)	UNIT 2 (Slave n. 1)	UNIT 3 (Slave n. 2)	UNIT 4 (Slave n. 3)
1	Entering water temp.	N.U.	N.U.	N.U.
2	Leaving water Temp.	N.U.	N.U.	N.U.
3	Cir1 Liquid Temp.	Cir2 Liquid Temp.	Cir3 Liquid Temp.	Cir4 Liquid Temp.
4	Comp.1 Oil Temp	Comp.2 Oil Temp	Comp.3 Oil Temp	Comp.4 Oil Temp
5	Oil Diff Transducer Circ 1	Oil Diff Transducer Circ 2	Oil Diff Transducer Circ 3	Oil Diff Transducer Circ 4
6	Setpoint Reset Override	Demand Limit Signal/Volt/Amps	N.U.	N.U.
7	Circuit 1 High pressure transducer	Circuit 2 high pressure transducer	Circuit 3 high pressure transducer	Circuit 4 high pressure transducer
8	Compr Capacity Sensor Circ 1	Compr Capacity Sensor Circ 2	Compr Capacity Sensor Circ 3	Compr Capacity Sensor Circ 4

Digital outputs

N	UNIT 1(Master)	UNIT 2 (Slave n. 1)	UNIT 3 (Slave n. 2)	UNIT 4 (Slave n. 3)
1	Circulation pump	N.U.	N.U.	N.U.
2	Line Contactor comp. 1	Line Contactor comp..2	Line Contactor comp. 3	Line Contactor comp..4
3	Star Contactor comp. 1	Star Contactor comp. 2	Star Contactor comp..3	Star Contactor comp. 4
4	Delta Contactor comp.1	Delta Contactor comp.2	Delta Contactor comp.3	Delta Contactor comp.4
5	N.U.	N.U.	N.U.	N.U.
6	Unloader 1 comp.1 C.	Unloader 1 comp.2 C.	Unloader 1 comp.3 C.	Unloader 1 comp.4 C.
7	Unloader 2 comp.1 S.	Unloader 2 comp.2 S.	Unloader 2 comp.3 S.	Unloader 2 comp.4 S.
8	Circuit 1 condens. Fan 3	Circuit 2 condens. Fan 3	Circuit 3 condens. Fan 3	Circuit 4 condens. Fan 3
9	Liquid Inj. 1	Liquid Inj. 2	Liquid Inj. 3	Liquid Inj. 4
10	Antifreeze heater	N.U.	N.U.	N.U.
11	General alarm cumulat.	General alarm cumulat.	General alarm cumulat.	General alarm cumulat.
12	Circuit 1 condens. Fan 1	Circuit 2 condens. Fan 1	Circuit 3 condens. Fan 1	Circuit 4 condens. Fan 1
13	Circuit 1 condens. Fan 2	Circuit 2 condens. Fan 2	Circuit 3 condens. Fan 2	Circuit 4 condens. Fan 2

Analog outputs

N	UNIT 1(Master)	UNIT 2 (Slave n. 1)	UNIT 3 (Slave n. 2)	UNIT 4 (Slave n. 3)
1	Condens. fan-speed reg. 1	Condens. fan-speed reg. 2	Condens. fan-speed reg. 3	Condens. fan-speed reg. 4
2	N.U.	N.U.	N.U.	N.U.

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Water cooled screw compressors unit   WHS

MACHINE TYPE "0"

Digital input

N	UNIT 1(Master)	UNIT 2 (Slave n. 1)	UNIT 3 (Slave n. 2)	UNIT 4 (Slave n. 3)
1	On/Off by Main Switch	On/Off by Main Switch	On/Off by Main Switch	On/Off by Main Switch
2	Evaporator flow controller (enabling)	Evaporator flow controller (enabling)	Evaporator flow controller (enabling)	Evaporator flow controller (enabling)
3	Remote On/Off	N.U. (Not Used)	N.U.	N.U.
4	Oil Level 1	Oil Level 2	Oil Level 3	Oil Level 4
5	Low pressure pressure switch 1	Low pressure pressure switch 3	Low pressure pressure switch 1	Low pressure pressure switch 3
6	Oil differential 1 (I series only)	Oil differential 2 (I series only)	Oil differential 3 (I series only)	Oil differential 4 (I series only)
7	Phase Monitor (enabling)	Phase Monitor (enabling)	Phase Monitor (enabling)	Phase Monitor (enabling)
8	Double Setpoint	N.U.	N.U.	N.U.
9	N.U.	N.U.	N.U.	N.U.
10	Failed trans. Y/Δ	Failed trans. Y/Δ	Failed trans. Y/Δ	Failed trans. Y/Δ
11	High pressure pressure switch 1	High pressure pressure switch 2	High pressure pressure switch 3	High pressure pressure switch 4
12	Comp.thermal 1	Comp.thermal 2	Comp.thermal 3	Comp. thermal 4

Analog inputs

N	UNIT 1(Master)	UNIT 2 (Slave n. 1)	UNIT 3 (Slave n. 2)	UNIT 4 (Slave n. 3)
1	Entering water temp.	N.U.	N.U.	N.U.
2	Leaving water Temp.	Outlet Cond. Temperature	N.U.	N.U.
3	Inlet Condenser Temp. Circ 1	Inlet Condenser Temp Circ 2	Inlet Condenser Temp Circ 3	Inlet Condenser Temp Circ 4
4	Comp.1 Oil Temp	Comp.2 Oil Temp	Comp.3 Oil Temp	Comp.4 Oil Temp
5	Oil Diff Transducer Circ 1	Oil Diff Transducer Circ 2	Oil Diff Transducer Circ 3	Oil Diff Transducer Circ 4
6	Setpoint Reset Override	Demand Limit Signal/Volt/Amps	N.U.	N.U.
7	Circuit 1 High pressure transducer	Circuit 2 high pressure transducer	Circuit 3 high pressure transducer	Circuit 4 high pressure transducer
8	Compr Capacity Sensor Circ 1	Compr Capacity Sensor Circ 2	Compr Capacity Sensor Circ 3	Compr Capacity Sensor Circ 4

Digital outputs

N	UNIT 1(Master)	UNIT 2 (Slave n. 1)	UNIT 3 (Slave n. 2)	UNIT 4 (Slave n. 3)
1	Circulation pump	N.U.	N.U.	N.U.
2	Line Contactor comp. 1	Line Contactor comp..2	Line Contactor comp. 3	Line Contactor comp..4
3	Star Contactor comp. 1	Star Contactor comp. 2	Star Contactor comp..3	Star Contactor comp. 4
4	Delta Contactor comp.1	Delta Contactor comp.2	Delta Contactor comp.3	Delta Contactor comp.4
5	N.U.	N.U.	N.U.	N.U.
6	Unloader 1 comp.1 C.	Unloader 1 comp.2 C.	Unloader 1 comp.3 C.	Unloader 1 comp.4 C.
7	Unloader 2 comp.1 S.	Unloader 2 comp.2 S.	Unloader 2 comp.3 S.	Unloader 2 comp.4 S.
8	Circuit 1 condens. Tower fan 3	Circuit 2 condens. Tower fan 3	Circuit 3 condens. Tower fan 3	Circuit 4 condens. Tower fan 3
9	Liquid Inj. 1	Liquid Inj. 2	Liquid Inj. 3	Liquid Inj. 4
10	N.U.	N.U.	N.U.	N.U.
11	General alarm cumulat.	General alarm cumulat.	General alarm cumulat.	General alarm cumulat.
12	Circuit 1 condens. Tower fan 1	Circuit 2 condens. Tower fan 1	Circuit 3 condens. Tower fan 1	Circuit 4 condens. Tower fan 1
13	Circuit 1 condens. Tower fan 2	Circuit 2 condens. Tower fan 2	Circuit 3 condens. Tower fan 2	Circuit 4 condens. Tower fan 2

Analog outputs

N	UNIT 1(Master)	UNIT 2 (Slave n. 1)	UNIT 3 (Slave n. 2)	UNIT 4 (Slave n. 3)
1	Conden. tower fan-speed reg. 1	Conden. tower fan-speed reg. 2	Conden. tower fan-speed reg. 3	Conden. tower fan-speed reg. 4
2	N.U.	N.U.	N.U.	N.U.

Water cooled screw compressors unit   PFS

MACHINE TYPE "3"

Digital inputs

N	UNIT 1(Master)	UNIT 2 (Slave)		
1	On/Off by Main Switch	On/Off by Main Switch		
2	Evaporator flow controller (enabling)	Evaporator flow controller (enabling)		
3	Remote On/Off	N.U. (Not Used)		
4	Oil Level 1	Oil Level 2		
5	Low pressure switch 1	Low pressure switch 2		
6	Oil differential 1	Oil differential 2		
7	Phase Monitor (enabling)	Phase Monitor (enabling)		
8	Double Setpoint	N.U.		
9	N.U.	N.U.		
10	Failed trans. Y/Δ	Failed trans. Y/Δ		
11	High pressure switch 1	High pressure switch 2		
12	Comp.thermal 1	Comp.thermal 2		

Analog inputs

N	UNIT 1(Master)	UNIT 2 (Slave)		
1	Entering water temp.	Ent. condens. temp.		
2	Leaving water temp.	Outlet Condenser Temperature		
3	Liquid Temperature Circ 1 (opt.)	Liquid Temperature Circ 2 (opt.)		
4	Comp.1 Oil Temp	Comp.2 Oil Temp		
5	Oil Diff Transducer Circ 1	Oil Diff Transducer Circ 2		
6	Setpoint Reset Override	Demand Limit Signal		
7	High pressure transducer	Voltage/Amps		
8	Compr Capacity Sensor circ 1	Compr Capacity Sensor circ 2		

Digital outputs

N	UNIT 1(Master)	UNIT 2 (Slave)		
1	Circulation pump	N.U.		
2	Line Contactor comp. 1	Line Contactor comp..2		
3	Star Contactor comp. 1	Star Contactor comp. 2		
4	Delta Contactor comp.1	Delta Contactor comp..2		
5	N.U.	N.U.		
6	Unloader 1 comp.1 C.	Unloader 1 comp.2 C.		
7	Unloader 2 comp.1 S.	Unloader 2 comp.2 S.		
8	Circuit 1 condens. Tower fan 3	Circuit 2 condens. Tower fan 3		
9	Liquid Inj. 1	Liquid Inj. 2		
10	N.U.	N.U.		
11	General alarm cumulat.	General alarm cumulat.		
12	Circuit 1 condens. Tower fan 1	Circuit 2 condens. Tower fan 1		
13	Circuit 1 condens. Tower fan 2	Circuit 2 condens. Tower fan 2		

Analog outputs

N	UNIT 1(Master)	UNIT 2 (Slave)		
1	Conden. tower fan-speed reg. 1	Conden. tower fan-speed reg. 2		
2	N.U.	N.U.		

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MicroTech II terminal

The MicroTech II terminal has following features:

- 4-lines by 20-character liquid crystal display
- Removable and remote key-pad
- Key-pad consisting of 15 keys " clear language display "
- Memory to protect the data
- General faults alarm led
- 4-level password access to modify the setting
- Service report dislaying all working hours and general conditions

MicroPlant^{TM}:
Solution for: tele-maintenance and supervisory systems

μLAN^{TM} systems can be monitored locally or via modem by MicroPlant^{TM} supervision program, that runs on PC systems under Windows '95 – '98 – 2000.

Connection: 2 wires RS485 or 5 wires RS422.

An optional plug&play μSER card and a TCONN is required on each unit in order to connect it to the serial line.

To interface with standard PC RS232, MicroPlant^{TM} needs of

- Serial Converter for local installation (max 16 units)
- Gateway for remote installation (max 16 units)

MicroPlant^{TM} is the best solution:

- To centralise all the information in just one local and/or remote PC
- To check all the parameters for each unit connected
- To be informed immediately and automatically of any alarm situation via modem - fax - voice message - printouts
- Data logging of temperature - humidity - pressure
- Automatic printouts of alarms, parameters and graphs
- To control several plants located in different geographical areas from a central station
- To manage the Service centers

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MicroPlant™ allows:

- Visualization and modification of all the parameters for each controller
- Protection of the main parameters against incidental modifications (different levels of passwords)
- Memorization of the detected values and visualization of their graphics
- Display, print-out and chronological memorization of the detected alarms
- Connection between local and remote computer via telephone line (Modem)

With MasterPlant it is possible to modify the operative parameters of each single controller and to display through a graph the stored historical data.
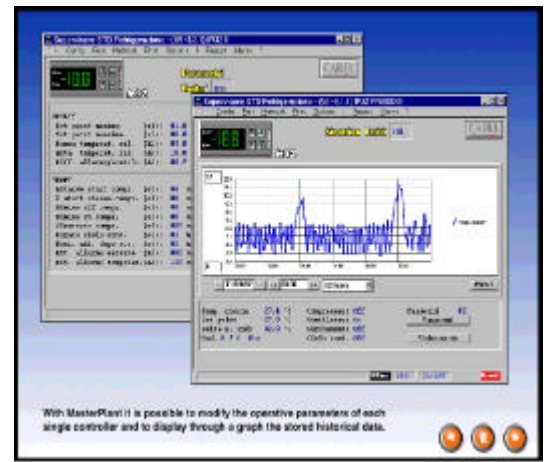
MicroTech II remote control

Compatibility with supervisory systems is becoming

increasingly important in HVAC. MicroTech II allows interfacing with BMS (Building Management Systems), the external world that can be:

Landis & Staefa, Siemens, Johnson, Honeywell, Satchwell, Trend, Bailey, Siebe, Allen Bradley.
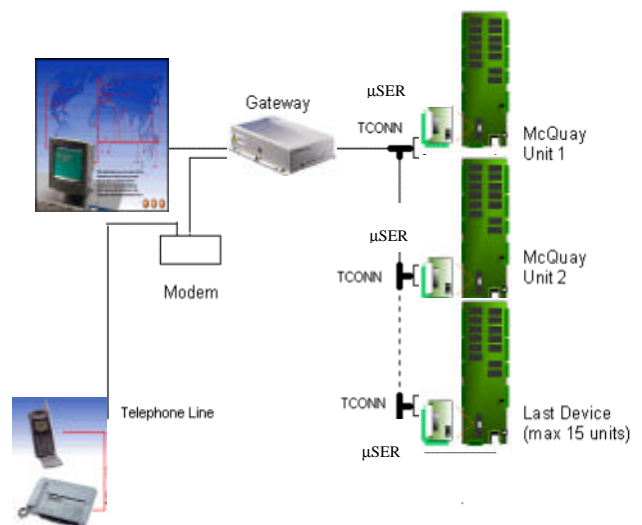

An optional plug&play µSER card and a TCONN is required on each MicroTech II in order to connect it to the serial line.

A specific gateway is required at the end of the serial line in order to convert McQuay protocol into the desired protocol.

McQuay offers several Gateways to interface the most commonly used protocols.

Available Gateways are: Modem/Serial (RS232C), Modbus, Bacnet.

For Echelon™ a special plug&play card is required on each MicroTech II instead of the µSER / Gateway system.

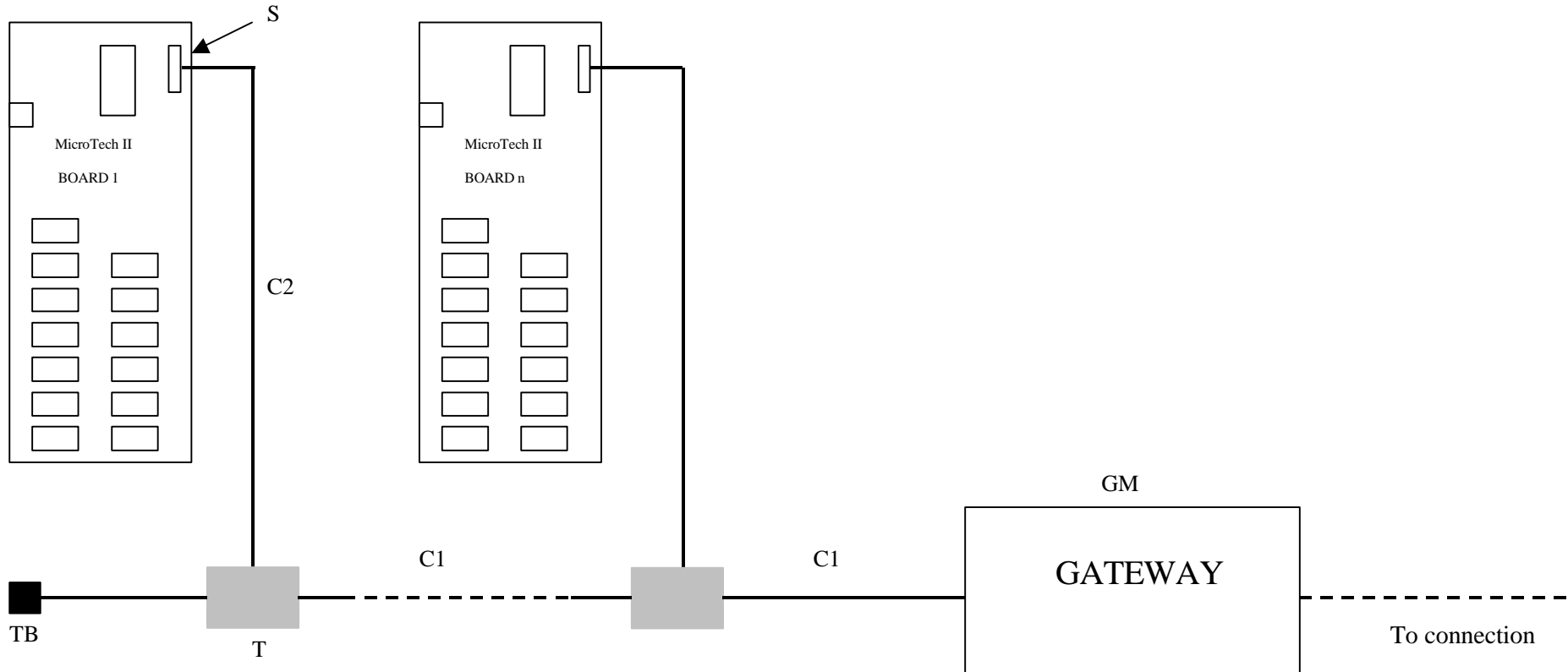## *Communication with the "old" MicroTech*

A special data translator gateway is required in order to interchange information with the old MicroTech world.

An optional plug&play µSER card and a TCONN are also required on each MicroTech II in order to connect it to the serial line.

In this way all features of CSC Panels become available and each MicroTech II (up to 16 units) can become a part of old MicroTech networks.

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MicroTech II

BOARD 1

MicroTech II

BOARD n

GM

GATEWAY

S

C2

C1

C1

TB

T

To connection

C1   = Serial RS422 Cable **by Customer**
S   = Serial Connection Card RS422 µSER
T   = "T" Shunter TCONNJ000
TB   = Line RS422 Locked **by Customer**

GM
- = Gateway000 for Modem
- = GatewayMB0 for Modicon Modbus comm. protocol
- = GatewayBAC for Bacnet comm. protocol
- = Gateway for connection with "old Microtech"

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