Network Accessories: 4683 Series

4683-TTM  RS-485 to RS-485 Network Repeater

**Description**

**Models**
- 4683-TTM-1F: 115V AC Power
- 4683-TTM-2F: 230V AC Power
- 4683-TTM-3F: 24V AC Power

Acromag’s RS-485 network repeater device allows users to take full advantage of the RS-485 standard’s extended communication distances and multi-dropping capabilities. In addition, these devices offer field selectable End-of-Line Network (EOLN) terminations on both the A and B networks.

Operation is transparent to all devices and no handshaking is required. Up to thirty-two RS-485 devices can be driven. Network repeaters are ready to mount on any base plate. Or, for a harsh environment, it can be installed in a NEMA enclosure of your choice. No enclosure is necessary for use in a laboratory or office.

Installation requires mounting, connecting power and cables, and setting the baud rate.

**Approvals**

UL/cUL listed:
Energy management equipment

**Key Features & Benefits**

- Designed for use with Johnson Controls N2 or BACnet bus
- No handshaking
- No extra control lines
- I/O signal isolation
- Baud rates of 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, and 76.8K are switch selectable
- Field-selectable end-of-line network terminations on both A and B sides
- Electrical transient protection is provided. This protects the host computer from destructive noise spikes and other transient signals.
- Status LED’s indicate transmission direction and power applied.
- 24/115/230V AC power available
- No separate transformer required with 24V AC units (4683-TTM-3F)

**Operation**

Model 4683-TTM-xf network repeaters isolate and boost RS-485 signals allowing communication signals to travel another 4000 ft. Each repeater permits the addition of another 32 unit load to a network.

The repeater has two RS-485 “sides” known as the A and B sides. The A side typically connects to the network towards the host and the B side connects to the extended network. Functionally, the A and B sides are equivalent.

Repeaters receive AC power through a 3-screw terminal strip. Transient signal protection is provided on both RS-485 sides.

When both RS-485 lines are idle, each side is in receive mode. When a “1” to “0” transition is detected (signifying a start bit) on either side, the opposite side’s transmitter is enabled. The transmitter stays enabled for one character’s time (based on the baud rate switch setting). The received character is then passed through.
The station configuration drawing is for general illustration purposes only. Johnson Controls system customers should instead refer to the Metasys® Network Technical Manual for N2 Bus Communication, or the MS/TP Communication Bus Technical Bulletin for wiring connections using the 4683-TTM-xF repeater.
4683-TTM  RS-485 to RS-485 Network Repeater

MODEL 4683-TTM-1F REPEATER
MODEL 4683-TTM-2F REPEATER
MODEL 4683-TTM-3F REPEATER

End-of-Line (EOL) Termination Jumper Locations.  
Input Power Fuse Location.

NOTE:  
-3F 24V AC units do not require a separate transformer. 24V AC power from the RS-485 devices may be used.

Switch Variation  
Slide Switch
Slide with arrow to turn ON.  
Slide opposite to arrow to turn OFF.

Toggle Switch
Depress toward numbers to turn On (Closed).  
Depress toward OPEN to turn Off.

Network Connections

Status LEDs
Baud Rate Switches
Status LEDs

EOL JUMPERS EQUIVALENT CIRCUIT  
(4683 UNITS ONLY)

FUSE 3AG  
0.5A, 250V

NOTE:
-3F 24V AC units do not require a separate transformer. 24V AC power from the RS-485 devices may be used.

4683-TTM-1F (115VAC)  
4683-TTM-2F (230VAC)  
4683-TTM-3F (24VAC)

END OF LINE (EOL) TERMINATION JUMPERS  
EOL JUMPER SIDE A (IN)
1 - 600  2 - 1200  3 - 2400  
4 - 4800  5 - 9600  6 - 19.2K  
7 - 38.4K  8 - 76.8K

TYP  
0.30  (7.62)  
3.70  (93.98)  
4.30  (109.22)

POWER  
1200 OHMS  
220 OHMS  
1200 OHMS

BAUD RATE  
1 - 600  2 - 1200  3 - 2400  
4 - 4800  5 - 9600  6 - 19.2K  
7 - 38.4K  8 - 76.8K

NOTE:
-3F 24V AC units do not require a separate transformer. 24V AC power from the RS-485 devices may be used.

G W L1  
4683-TTM-1F (115VAC)  
G L2 L1  
4683-TTM-2F (230VAC)  
G COM HOT  
4683-TTM-3F (24VAC)

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4683-TTM  RS-485 to RS-485 Network Repeater

Performance Specifications

■ Communication Specifications

Baud Rates
Switch settings on unit for 600, 1200, 2400, 4800, 9600, 19.2K, 38.4K, and 76.8K baud rates. Switch must be in the proper baud rate position for proper operation.

RS-485 Bus Loading
One unit load equivalent.

RS-485 Bus Drive
Complete RS-485 compliance for up to 32 unit loads (31 unit loads if a repeater is used).

End-of-Line Termination Network
The EOLN termination network is shown on the right and is individually selected on both the A and B sides by a pair of shorting clips. The A-side is controlled by jumper pair J1, J2 and the B-side is controlled by jumper pair J3 and J4.

The EOLN termination network is enabled for the A side or B side when the associated pair of jumpers are positioned over pins 1 and 2. Conversely, the EOLN is disabled (out of the circuit) when the pair jumpers are positioned over pins 2 and 3.

Duplex
Half duplex only.

Data Format
Ten bits typical (1 start bit, 8 data bits, and 1 stop bit). Other formats are supported.

■ Specifications

Power Line Fuse
0.5A, 125V, 0.75A, 3AG type.

Isolation
Provides galvanic and opto-coupler isolation between RS-485(A), RS-485(B), AC power, and chassis ground. Common mode voltages are permitted up to 250V rms or 354V DC (withstands a 1500V AC dielectric strength test for 1 min. without breakdown) on a continuous basis. Complies with requirements outlined in ANSI C39.5-1974 for voltage ratings specified.

RFI Resistance
Withstands an RFI field strength of 10V per meter at 27 Mhz, 151 Mhz, and 467 Mhz with no digital effect, per SAMA PMC 33.1.

Line Noise Effects
Field and power line terminals withstand ANSI/IEEE C37.90-1978 Surge Withstanding Capability (SWC) Test with no component failures. Unit is tested to a standardized test waveform that is representative of surges (high-frequency transient electrical interference), observed in actual installations.

Communications Connections
Network repeater - both RS-485 connectors use modular terminal blocks with screw clamps. Wire range 14 to 26 AWG.

Power Wire Connections
Network repeater terminal block. See label on unit for power to be applied to unit.

Shipping Weight
3.0 pounds (1.4 kg) packed per unit

■ Environmental

Operating Temperature
-25 to 70° C (-13 to 158° F)

Storage Temperature
-25 to +85° C (-13 to 185° F)

Relative Humidity
0 to 95% RH (noncondensing), up to 40° C (104° F)

Power
4683-TTM-1F
115VAC ±10%, 50/60 Hz, 0.05A

4683-TTM-2F
230VAC ±10%, 50/60 Hz, 0.03A

4683-TTM-3F
24VAC ±10%, 50/60 Hz, 0.18A typical

Approvals
UL/cUL listed – energy management equipment

Ordering Information

Models
4683-TTM-1F
115V AC Power

4683-TTM-2F
230V AC Power

4683-TTM-3F
24V AC Power

Accessories
See www.acromag.com for more information.

ISO9001
AS9100

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