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Bulletin No. CSMSTR-A
Drawing No. LP0541
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MODEL CSMSTR – MODULAR CONTROLLER SERIES MASTER

- *PROVIDES HIERARCHICAL CONTROL OF OTHER MODULES IN THE MODULAR CONTROLLER SERIES*
- *PROVIDES POWER AND COMMUNICATIONS TO MODULES THROUGH BACKPLANE CONNECTOR*
- *STORES MODULE CONFIGURATION INFORMATION, AND AUTOMATICALLY REPROGRAMS REPLACED MODULES*
- *AUTO MODULE IDENTIFICATION AND ADDRESSING MINIMIZES CONFIGURATION TIME*
- *FULLY ISOLATED DESIGN PROVIDES RELIABLE OPERATION*
- *SERIAL PORTS PROVIDE A VARIETY OF INTEGRATION METHODS*
- *EXTENSIVE BUILT-IN SERIAL DRIVER LIST ALLOWS EASY DATA MAPPING TO PLCS*
- *10-BASE-T ETHERNET CONNECTION PROVIDES NETWORKING CAPABILITY*
- *WINDOWS® CONFIGURATION SOFTWARE*
- *SUPPORTS UP TO 16 MODULAR CONTROLLER SERIES MODULES*

CE

GENERAL DESCRIPTION

The Model CSMSTR is a communications and control platform designed for use with Modular Controller Series slave modules. The CSMSTR uses a proprietary high speed serial protocol to communicate, via backplane connection, with up to 16 slave modules. Through the same connection, the Master also provides power to the slaves.

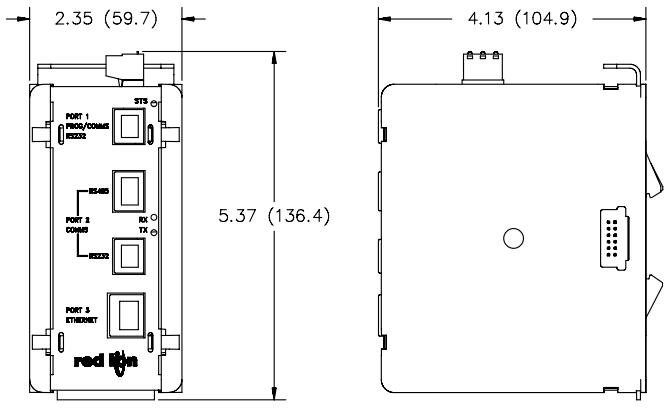
When powered up, the CSMSTR automatically identifies and addresses connected slave modules. By storing the configuration information of all of the modules, the CSMSTR is able to automatically configure modules if they are replaced.

The Master provides a serial port and an Ethernet port for connection to PCs, PLCs, and SCADA systems. An extensive list of master and slave protocol drivers are available to allow the CSMSTR to share and exchange variable data with external devices. The 10-base-T Ethernet port can also be used to connect and share data with other devices at high speeds.

Windows® compatible Crimson™ software makes it easy to map variables from the Modular Controller platform to external devices.

The design of the Modular Controller Series high density packaging and DIN rail mounting saves time and panel space. The backplane connection provides power and communication to the modules. The controller snaps easily onto standard top hat (T) profile DIN rail.

DIMENSIONS In inches (mm)



SOFTWARE

The CSMSTR is programmed with Windows® compatible Crimson™ software. The software is an easy to use, graphical interface which provides a means of communication configuration, as well as commissioning and calibration of new systems.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller. An independent and redundant temperature limit indicator with alarm outputs is strongly recommended.

CAUTION: Read complete instructions prior to installation and operation of the unit.

SPECIFICATIONS

1. **POWER**: 24 VDC ± 10%
   400 mA min. (1 module)
   3 Amps max. (16 modules)
2. **COMMUNICATIONS**:
   Port 1 – Programming Port – RS232, RJ-11 connector. 115.2 K Baud max.
   Port 2 – Communications Port – RJ-45 connector for RS485*,
   RJ-11 connector for RS232*. 115.2 K Baud max.
   *These two connections share the same hardware, act as a single port.
   RS485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC,
   V_{OL} = 0.5 V @ 25 mA max.
   Port 3 – Ethernet – RJ45, 10-base-T
3. **LEDs**:
   STS – Status LED indicates condition of master
   TX/RX – Transmit/Receive LEDs show Port 2 serial activity
   Ethernet – Link and activity LEDs
4. **MEMORY**: 512k RAM
5. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 50°C
   Storage Temperature Range: -40 to +85°C
   Operating and Storage Humidity: 85% max relative humidity,
   non-condensing, from 0 to 50°C
   Altitude: Up to 2000 meters
6. **CONSTRUCTION**: Case body is burgundy high impact plastic and stainless steel. Installation Category I, Pollution Degree 2.
7. **POWER CONNECTION**: Removable wire clamp screw terminal block.
   Wire Gage Capacity: 24 AWG to 12 AWG
   Torque: 4.45 to 5.34 in/lb (0.5 to 0.6 N-m)
8. **MOUNTING**: Snaps onto standard DIN style top hat (T) profile mounting rails according to EN50022 -35 x 7.5 and -35 x 15.
9. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   IEC 1010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
   ELECTROMAGNETIC COMPATIBILITY
   Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.
   Immunity to Industrial Locations:

Electrostatic discharge	EN 61000-4-2	Criterion A [3] 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion A 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 2 kV signal
Surge	EN 61000-4-5	Criterion A 1kV L-L,2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion A 3 V/rms
Emissions:		
Emissions	EN 55011	Class A

   Notes:
   1. Criterion A: Normal operation within specified limits.
   2. Criterion B: Temporary loss of performance from which the unit self-recovers.
   3. This device was designed for installation in an enclosure. To avoid electrostatic discharge to the unit in environments with static levels above 4 kV precautions should be taken when the device is mounted outside an enclosure. When working in an enclosure (ex. making adjustments, setting jumpers etc.) typical anti-static precautions should be observed before touching the unit.
10. **WEIGHT**: 13 oz (368.5 g)

HARDWARE

INSTALLATION

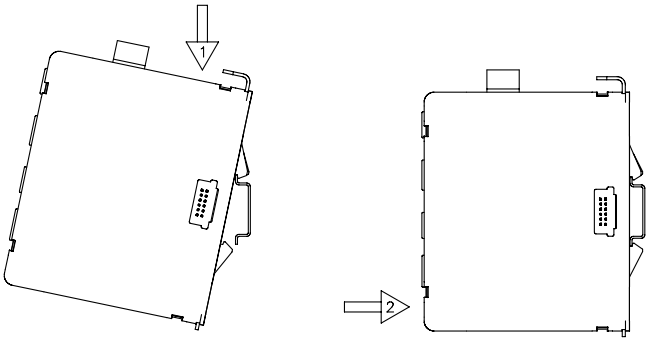


Figure 1 - Attach CSMSTR Master To DIN Rail

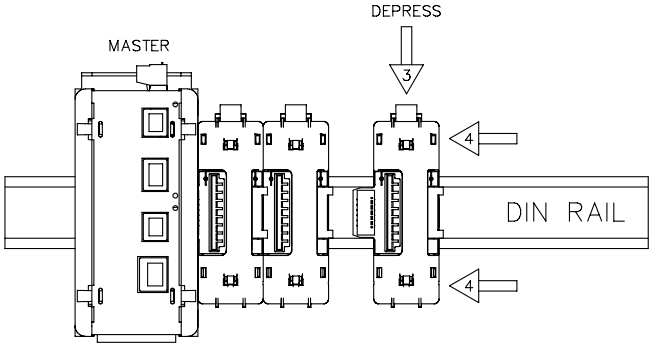


Figure 2 - Attach Slave Bases To DIN Rail

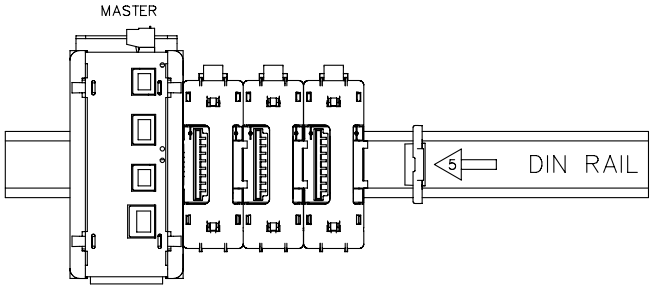


Figure 3 - Attach Termination Plug*

* Supplied with CSMSTR Master Module.

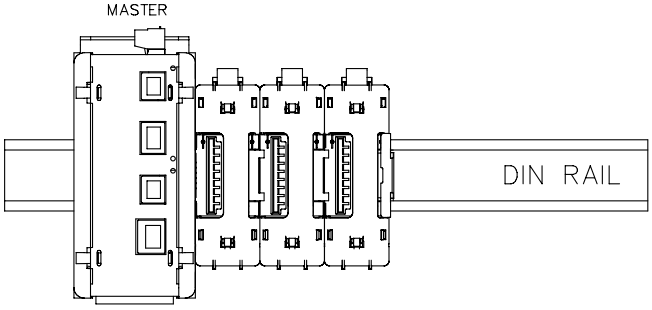


Figure 4 - Installation Complete

EMC INSTALLATION GUIDELINES

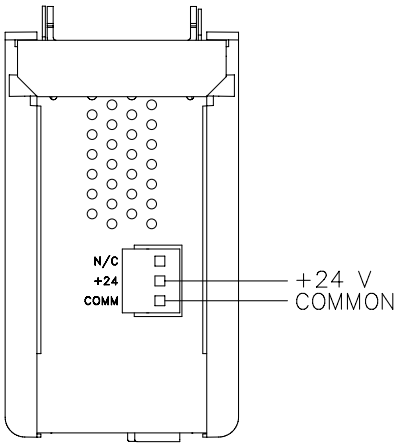
Although Red Lion Controls Products are designed with a high degree of immunity to Electromagnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, source or coupling method into a unit may be different for various installations. Cable length, routing, and shield termination are very important and can mean the difference between a successful or troublesome installation. Listed are some EMI guidelines for a successful installation in an industrial environment.

1. To reduce the chance of noise spikes entering the unit via the power lines, connections should be made to a clean source. Connecting to circuits that also power loads such as contactors, relays, motors, solenoids etc. should be avoided.
2. A unit should be mounted in a metal enclosure, which is properly connected to protective earth.
   a. The mounting clip that connects to the DIN rail should have the DIN rail connected to protective earth.
3. Use shielded (screened) cables for all Signal and Control inputs. The shield (screen) pigtail connection should be made as short as possible. The connection point for the shield depends somewhat upon the application. Listed below are the recommended methods of connecting the shield, in order of their effectiveness.
   a. Connect the shield to earth ground (protective earth) at one end where the unit is mounted.
   b. Connect the shield to earth ground at both ends of the cable, usually when the noise source frequency is over 1 MHz.
   c. Connect the shield to common of the module and leave the other end of the shield unconnected and insulated from earth ground.
4. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run through metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter. Also, Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
5. Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.
6. In extremely high EMI environments, the use of external EMI suppression devices is effective. The following EMI suppression devices (or equivalent) are recommended:
   Ferrite Suppression Cores for signal and control cables:
   Fair-Rite part number 0443167251 (RLC part number FCOR0000)
   TDK part number ZCAT3035-1330A
   Steward part number 28B2029-0A0
   Line Filters for input power cables:
   Schaffner part number FN610-1/07 (RLC part number LFIL0000)
   Schaffner part number FN670-1.8/07
   Corcom part number 1 VR3

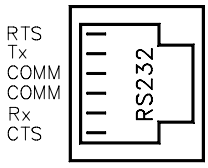
Visit RLC's web site at www.redlion-controls.com for more information on EMI guidelines, Safety and CE issues as they relate to Red Lion Controls products.

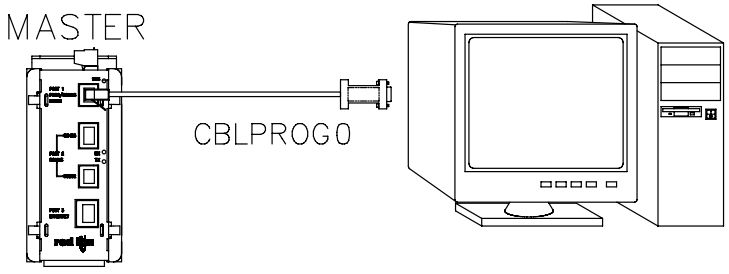
WIRING

POWER CONNECTION



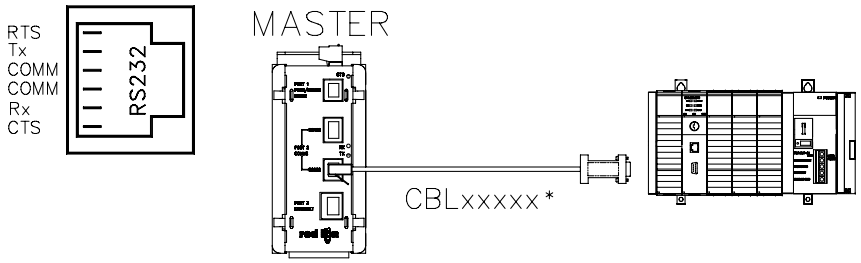
PORT 1 - PROGRAMMING PORT





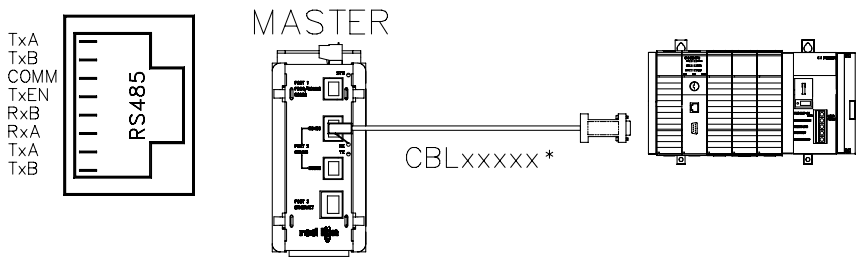
PORT 2 - COMMUNICATIONS PORT

RS232



OR

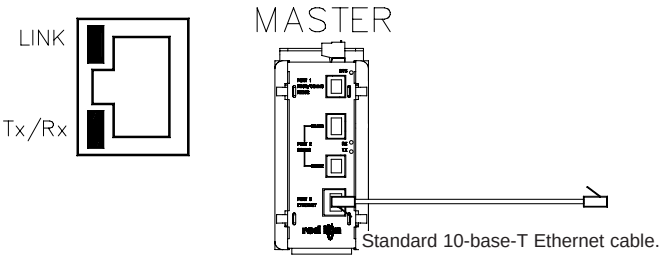
RS485



* Use appropriate communications cable. See Ordering Information for descriptions of the available cables.

WARNING: Do **NOT** use a standard DH-485 cable to connect this port to Allen Bradley equipment.

PORT 3 - ETHERNET CONNECTION



LEDs

STS – STATUS LED

The green Status LED provides information regarding the state of the Master, as well as the rest of the system. This includes indication of the various stages of the start-up routine (power-up), and any errors that may occur.

Startup Routine

Rapidly Flashing	Master is currently running the boot loader and/or being flash upgraded by Crimson.
Steady	Master is operating properly.

Error States

1 blink, pause, repeat	One or more slave modules are missing from the system. Master and installed modules will perform normally in this state.
2 blinks, pause, repeat	Missing configuration, or configuration being updated by Crimson.
3 blinks, pause, repeat	Quantity of module bases does not match configuration file. Master will not communicate with the modules until the error is corrected.
4 blinks, pause, repeat	Termination plug not installed, or one or more bases are malfunctioning. Master will not communicate with the modules until the plug is reinstalled, and power is cycled.

TX/RX LEDS

Indicate Port 2 activity

ETHERNET LEDS

Yellow – Hardware link established
Green – Flashing indicates activity

CONFIGURATION

Programming is done via Crimson, a Windows® compatible configuration interface. Please see the Crimson manual for more information.

ORDERING INFORMATION

TYPE	MODEL NO.	DESCRIPTION	PART NUMBER
Master Module	CSMSTR	Controller Series Master, Comms, Ethernet	CSMSTRSE
Input Modules	CSTC	8 Channel Thermocouple Module	CSTC8000
	CSINI	8 Channel 0(4)-20 mA Input Module	CSINI800
	CSINV	8 Channel ±10 V Input Module	CSINV800
PID Control Modules	CSPID1	Single Loop Module, Relay Outputs	CSPID1R0
		Single Loop Module, Relay Outputs, Analog Output	CSPID1RA
		Single Loop Module, Relay Outputs, Heater Current Input	CSPID1RM
		Single Loop Module, Solid State Outputs	CSPID1S0
		Single Loop Module, Solid State Outputs, Analog Output	CSPID1SA
		Single Loop Module, Solid State Outputs, Heater Current Input	CSPID1SM
	CSPID2	Dual Loop Module, Relay Outputs	CSPID2R0
		Dual Loop Module, Relay Outputs, Heater Current Input	CSPID2RM
		Dual Loop Module, Solid State Outputs	CSPID2S0
		Dual Loop Module, Solid State Outputs, Heater Current Input	CSPID2SM
		Dual Loop Module, Triac Outputs	CSPID2T0
		Dual Loop Module, Triac Outputs, Heater Current Input	CSPID2TM
Communications Cables (10 feet)	CBL	ALLEN BRADLEY SLC-503 Via DF 1	CBLAB001
		ALLEN BRADLEY PLC-5 Via CHNL 0	CBLAB002
		ALLEN BRADLEY Via DH485	CBLAB003
		GE FANUC 90S Via SNP	CBLGEF01
		GENERIC RS232 TO MALE 9-PIN	CBLGEN01
		GENERIC RS232 BARE WIRES	CBLGEN02
		GENERIC RS422/485 BARE WIRE	CBLGEN03
		MITSUBISHI FX	CBLMIT01
		MITSUBISHI FX0 & FX0N	CBLMIT02
		MODICON (RS232)	CBLMOD01
		OMRON SYSMAC CP SERIES (RS232)	CBLOMR01
		Modular Controller to Paradigm via RS232	CBLPAR01
		Modular Controller to Paradigm via RS485	CBLPAR02
		SIEMENS S7 PPI	CBLSIE01
		SIEMENS MPI W/O ADAPTER	CBLSIE02
		SIEMENS MPI W/ ADAPTER	CBLSIE03
		Programming Cable for CS, G3, & Paradigm Series	CBLPROG0
Software		Crimson Programming Software	SFCRM *
		Crimson, Manual, and Download Cable	SFCRK
Accessories		Rail Stops (Qty 2)	RSRSTP00
		Replacement Base	CSBASE00
		Replacement Termination Plug	CSTERM00

* Free at www.modularcontroller.com

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LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to one year from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company's products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.

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