MOSCAD
Motorola SCADA Remote Terminal Unit

MOTOROLA
intelligence everywhere™

The MOSCAD Remote Terminal Unit (RTU) provides a data collection and processing unit with the intelligence required to operate in sophisticated Supervisory Control and Data Acquisition (SCADA) systems. Communications via two-way radio, digital microwave radio, Ethernet and wirelines is supported.

LOCAL INTELLIGENCE

MOSCAD is a microprocessor-based RTU with large memory capacity that can make control decisions on-site based on status conditions and values from local and remote sources.

▶ Local intelligence permits control decisions without the need for real-time messages from other supervisory centers; MOSCAD can operate in sophisticated control systems.

PROGRAMMABLE

MOSCAD uses an advanced symbolic ladder logic application language to develop the data base conditions, values, and RTU profile that must exist for each control action, message transmission, etc. to occur. Routines written in 'C' may be executed as part of the total application.

▶ Powerful applications may easily be defined using industry accepted ladder logic and 'C'. The task is made easier by using the SCADA Application Development software and a PC-style computer.

PROTOCOLS

MOSCAD uses the OSI-based MDLC communication protocol for all data signaling. Multiple 3rd-party protocols, including Modbus, DNP 3.0, PLC-5, X.25, and many more are also supported.

▶ MDLC was specifically developed for two-way radio use but is completely applicable to microwave, wire-line, and other media. It permits large volumes of data to be quickly transferred between terminals using packet transmission techniques.

▶ A library of 3rd-party protocol drivers is available. Some drivers, such as DNP 3.0, replace the MDLC protocol. Other drivers, such as Modbus, provide connectivity on-site or between sites while retaining the benefits of MDLC.

COMMUNICATIONS

MOSCAD permits communications to occur RTU-to-central and RTU-to-RTU (peer-to-peer). Communications may occur between individual units or may be broadcast to several units simultaneously. Store-&-forward may be employed to pass messages RTU-to-RTU throughout the system.

► Direct communications where possible or repeated messaging over one or multiple communication media may be intermixed within the system.

UPLOAD/DOWNLOAD

MOSCAD, via the MDLC data transfer capability, uploads the data collected and calculated by the application program to a central site. It also receives downloaded changes to the application program and/or to the parameters that control how the application operates.

► The process being supervised does not need to be static; operational variables and limits, and the process definition itself, can be easily changed and transmitted to the RTU from anywhere in the system. Site visits by maintenance personnel are not required.

RS232/RS485

Connectors on the CPU module permit the connection of a terminal for application programming, or connection to other on-site devices to supervise their operation, and to the communication media device. An RS232 Multiplex accessory expands the connectivity of any single CPU port.

► Multiple connectors, multiple communication protocols, and variable data speeds allow practically all external data devices to be connected to the CPU module.

NEMA ENCLOSURE

MOSCAD is provided in a painted steel NEMA-4 rated enclosure that contains the power supply, battery, two-way radio, CPU module, and space for five expansion I/O modules. Optional enclosures are available in stainless steel (NEMA-4X) or plastic; smaller enclosures in painted steel or plastic are available when no more than two expansion I/O modules are needed. The enclosure may be deleted when desired.

► The correct enclosure for the environment is typically available.

RACKMOUNT

MOSCAD may be ordered on panels that permit direct mounting onto standard 19" equipment racks. The module panel contains space for one CPU module and up to seven expansion I/O modules; additional module panels may be added to extend the I/O module total to 63. The power supply and radio panel contains space for a second power supply and radio when required. Optionally, the module panel may be deleted and a three-module motherboard placed onto the power supply panel.

► The correct configuration for rack mounted installations is available.

CPU MODULE

The CPU module contains the microprocessor and associated RAM/ROM to control the connected I/O modules, the radio, and the communication ports. Critical applications will benefit by the addition of a second, redundant CPU module with auto-switchover should the primary CPU fail.

► All core functions, including system, application, and communication software, are contained in this module.

I/O MODULES

Digital and analog input, digital and analog output, and combination input/output modules are available for those on-site inputs and outputs.

► The digital input module includes high-speed counter capability. The relays on the digital output modules provide either momentary or latch operation.

DUAL POWER SUPPLY

MOSCAD is available with dual power supplies: a battery capable of fully powering the RTU and an AC operated power supply that also recharges the battery.

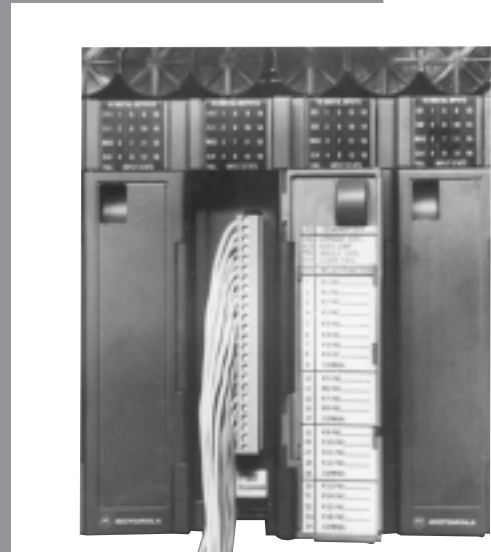► Dual power sources ensure continuing operation during AC power failures.

DIAGNOSTICS

MOSCAD incorporates self-diagnostic software routines to help maintenance personnel identify and correct operational problems. The ladder-logic application itself can log operational problems and transmit that data to a supervisory terminal using MDLC.

► Self diagnostics and error reporting capabilities, plus local LEDs, permit maintenance personnel to repair malfunctions in the shortest possible time.

Radio

Battery

Power Supply

CPU Module

I/O Modules

NEMA-4
Housing
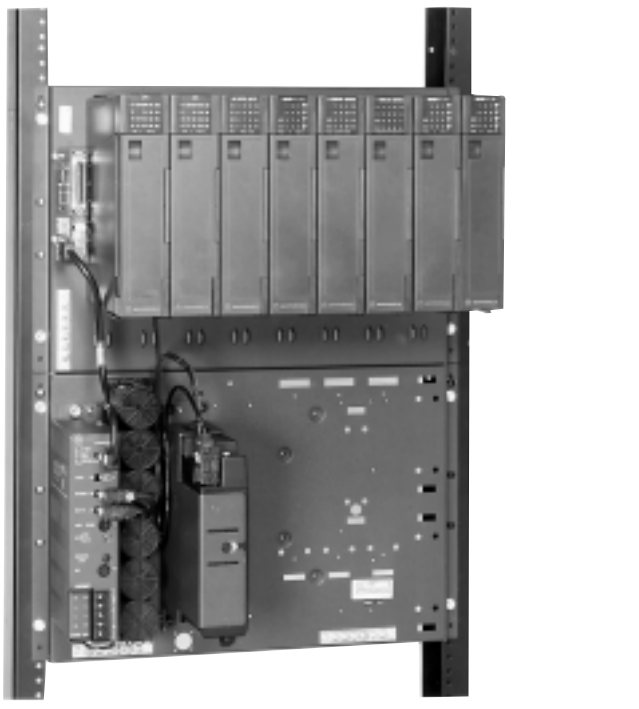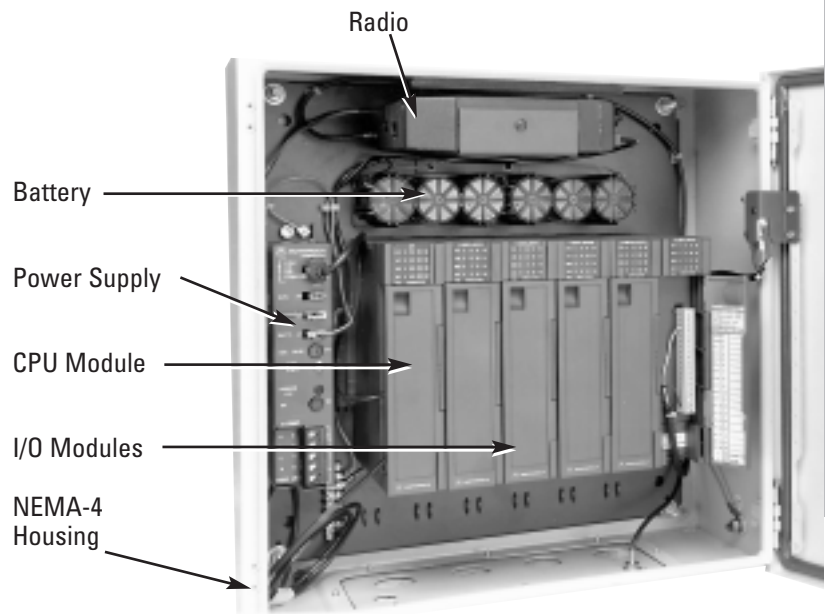
*Rackmount with space for 7 I/O
modules, expandable to 63*

*Plug-in I/O module showing
LEDs and user connector*

GENERAL

Physical	Standard: NEMA–4 painted steel enclosure (1-6 modules): 19.7″ x 19.7″ x 8.3″
	Small (option): NEMA–4 painted steel enclosure (1-3 modules): 14.97″ x 14.97″ x 8.3″
	Rack Mount (option): 12.25″ x 19″ module panel (1-8 modules) + 12.25″ x 19″ radio/power supply panel
Power Supply	MOSCAD provides 13.8 vdc @ 8 amp from 120 Vac 50/60 Hz (230 Vac optional); 12 vdc (nominal) battery
Environmental	−30° to +60°C; 95% RH @ +50°C
Expansion	Rack mount: eight additional module racks may be added for 63 total I/O modules

COMMUNICATION MEDIA

Wireline Modem	Dial-up (PSTN). leased-line (point-to-point), or multidrop; data speeds from 0.6 to 2.4 kbps. *See catalog sheet R3-11-93*
Microwave	Direct RS232 connection to digital microwave; data speed of 19.2 kbps
	Modem connection to analog microwave; data speed up to 2.4 kbps
Ethernet	Direct 10base T Ethernet connection to a customer-provided Intranet
	Note: Connection to the Intranet is not recommended.
Two-Way Radio	
Conventional	136-174 MHz @ 5 watt power output (including splinter channels); 12.5 kHz or 25 kHz channel bandwidths
	136-174 MHz @ 20 watt power output (including splinter channels); 12.5 kHz or 25 kHz channel bandwidths
	403-470 MHz @ 4 watt power output; 12.5 kHz or 25 kHz channel bandwidths
	403-470 MHz @ 20 watt power output; 12.5 kHz or 25 kHz channel bandwidths
	470-512 MHz @ 20 watt power output; 12.5 kHz or 25 kHz channel bandwidths
	800 MHz range @ 15 watt power output
	900 MHz range @ 12 watt power output
Trunked	136-174 MHz @ 20 watt power output; 12.5 kHz or 25 kHz channel bandwidths
	450-470 MHz @ 20 watt power output; 12.5 kHz or 25 kHz channel bandwidths
	800 MHz range @ 15 watt power output
	900 MHz range @ 12 watt power outpu
Emission	FI (DFM) and F3 (FSK and DPSK) available according to terms of system's radio license
	Refer to the MOSCAD System Planner for FCC Type Acceptance information

SUPPLEMENTAL DOCUMENTS THAT DESCRIBE THE INDIVIDUAL MOSCAD MODULES

CPU module	R3-11-82	Mixed I/O module	R3-11-88
16DI Digital Input module	R3-11-83	32dc DI Digital Input module	R3-11-89
16acDI Digital Input module	R3-11-84	60DI Digital Input module	R3-11-90
8AI Analog Input module	R3-11-85	32DO Digital Output module	R3-11-91
4AO Analog Output module	R3-11-86	Modems	R3-11-93
16DO Digital Output module	R3-11-87	8DO Digital Output (high current) module	R3-11-102

Copies available on the Internet at http://www.motorola.com/MOSCAD

Specifications subject to change without notice.

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R3-11-78H