



39SDM024DCCBN 16101-174/8

Siemens APACS+ Standard Discrete Module

Product scope

- Interfaces discrete DC sensors and actuators with a control module IOBUS.
- Provides 32 configurable channels for input, output, event recording or pulse-output functions.
- Uses current-sinking inputs, current-sourced outputs and per-output soft-fuse protection.
- Requires field polarity, output protection and shutdown-channel settings to be verified before replacement.

Manufacturer source

Siemens APACS+ and QUADLOG Product Line Cancellation Announcement, Appendix A

The enclosed Siemens pages identify 39SDM024DCCBN as an APACS+ standard discrete 24 V module and reproduce the related module-family configuration pages where available. The complete order and nameplate identifier is retained on this Apter cover for procurement matching.

Request a fast quote	Product reference	
Email: info@apterpower.com Phone: +86 18106909650 apter.com/inquiry.php	39SDM024DCCBN 16101-174/8	

The enclosed manufacturer pages are reproduced without alteration to technical content. External interactive links and unrelated pages are excluded from this web-optimized copy.

September 1, 2011

Reference: APACS+ and QUADLOG Product Line Cancellation Announcement

Appendix A:

UPH:16804-48	IFI QUADLOG Star Kit	Yes	
UPH:16807-33	POWER SUPPLY FILTER	Yes	
UPH:16809-10	SRSA WIRE TYPE KIT FOR 48VDC,	Yes	
UPH:16809-12	SRSA PLUG TYPE KIT FOR 48VDC,	Yes	
UPH:16809-6A	SRSA WIRE TYPE KIT-FOR 24VDC	Yes	
UPH:16809-8A	SRSA PLUG TYPE KIT-FOR 24VDC	Yes	
UPH:39ACM24BEN	CONTROLLER ADVANCED MODULE-4MB - APACS+	No	October 1, 2011
UPH:39ACM28AEN	CONTROLLER ADVANCED MODULE-8MB - APACS+	No	October 1, 2011
UPH:39ACM34AAN	CONTROLLER ACCEL ADVANCED 4MEG - APACS+	No	October 1, 2011
UPH:39ACM38AAN	CONTROLLER ACCEL ADVANCED 8MEG - APACS+	No	October 1, 2011
UPH:39BCMNB	MODULE BUS CONTINUATION - APACS+	Yes	
UPH:39BDMNB	MODULE BUS DIVERter - APACS+	Yes	
UPH:39EAMCB	MODULE ENHANCED ANALOG - APACS+	Yes	
UPH:39HFM2CB	MODULE HART FIELDBUS - APACS+	Yes	
UPH:39IDM115ACB	MODULE STANDARD DISCRETE INPUT - APACS+	Yes	
UPH:39ODM115ACB	MODULE STANDARD DISCRETE OUTPUT - APACS+	Yes	
UPH:39PFMAAN	MODULE PROFIBUS INTERFACE	Yes	
UPH:39PSR2ANCN	POWER RACK 200 WATT 115/230VAC	No	October 1, 2011
UPH:39PSR4ANDN	POWER RACK 400 WATT 115/230VAC	No	October 1, 2011
UPH:39PSR4ANEN	POWER RACK 400 WATT 115/230VAC	Yes	
UPH:39RTMCAN	MODULE RESISTANCE TEMPERATURE - APACS+	Yes	
UPH:39SAIAAN	MODULE STANDARD ANALOG INPUT - APACS+	Yes	
UPH:39SAMCAN	MODULE STANDARD ANALOG - APACS+	Yes	
UPH:39SCMNNNAAN	SATELLITE CONTROLLER MODULE	No	October 1, 2011
UPH:39SDM024DCCBN	MODULE STANDARD DISCRETE -24V - APACS+	Yes	
UPH:39SDM048DCCBN	MODULE STANDARD DISCRETE -48V - APACS+	Yes	
UPH:39VIMCCN	MODULE VOLTAGE INPUT - APACS+	Yes	
UPH:QLBCMNB	MODULE BUS CONTINUATION - QUADLOG	Yes	
UPH:QLBDMNB	MODULE BUS DIVERter - QUADLOG	Yes	
UPH:QLCAMAAN	MODULE CRITICAL ANALOG I/O - QUADLOG	Yes	
UPH:QLCAIAAN	MODULE CRITICAL ANALOG INPUT MODULE - QUADLOG	Yes	
UPH:QLCCM22AAN	MODULE CRITICAL CONTROL MODULE - QUADLOG	No	October 1, 2011
UPH:QLCCM24AAN	MODULE CRITICAL CONTROL MODULE - QUADLOG	No	October 1, 2011
UPH:QLCCM32AAN	MODULE CRITICAL CONTROL MODULE - QUADLOG	No	October 1, 2011
UPH:QLCCM36AAN	MODULE CRITICAL CONTROL MODULE - QUADLOG	No	October 1, 2011
UPH:QLCDM024DCBAN	MODULE CRITICAL DISCRETE IN 24V QUADLOG	Yes	
UPH:QLCDM048DCBAN	MODULE CRITICAL DISCRETE IN 48V QUADLOG	Yes	
UPH:QLCDODCAAN	MODULE CRITICAL DISCRETE OUT MODULE 24VDC to 125 VDC	Yes	
UPH:QLEAMBBN	MODULE ENHANCED ANALOG I/O - QUADLOG	Yes	
UPH:QLIDM115ACBBN	MODULE STANDARD DISCRETE INPUT (115VAC)	Yes	
UPH:QLODM115ACBBN	MODULE OUTPUT DISCRETE (32 CH, 115VAC)	Yes	
UPH:QLRTMBAN	MODULE RESISTANCE TEMPERATURE - QUADLOG	Yes	
UPH:QLSAMBAN	MODULE STANDARD ANALOG I/O - QUADLOG	Yes	

I/O Module and Channel Parameters

PARAMETER	SELECTION	DEFAULT
ProtectedOutput	Enabled, Disabled	Enabled
ReadBack	Enabled, Disabled	Enabled
Shutdown_Channel	TRUE, FALSE	FALSE

ProtectedOutput: Each output can be configured to turn off (0 mA) all SAM outputs in the event that diagnostics determine that the output current is greater than it is intended to be by 9% or more. You may want to configure an output as a ProtectedOutput if it is critical to the process, or if it presents a possible hazard to personnel or equipment.

ReadBack: The state of an output channel is automatically "read back" by input circuitry on the same channel. The readback is used to diagnose and report faults. You can disable readback which, in turn, disables reporting of readback related faults (i.e. Readback Lower than Output, Readback > Output, Readback > Output on Critical Channel).

Shutdown_Channel: When TRUE and channel quality is BAD or QUESTIONABLE, the SAM module disables (0 mA) and reports a shutdown error (Class 4, SSC 37, EC 31). Based on the default configuration supplied with QUADLOG, a class 4 error causes all outputs to shut down to their de-energized state (i.e. 0 volts or 0 mA). The configuration can be changed to only shut down the affected outputs or not to shut down at all. Only channels that are critical to the process should be configured as shutdown_channels. Note that in rack-to-rack redundant systems, a switchover to the standby side, rather than a system shutdown, occurs if an I/O failure occurs. Both sides of a redundant system would have to fail for a shutdown to occur. Refer to the section titled [Shutdown Logic](#).

7.10 QUADLOG Standard Discrete Module Plus (SDM+)

The Standard Discrete Module Plus (SDM+) interfaces discrete DC sensors and actuators with a control module's IOBUS. It provides 32 channels. Each channel can be configured to any of five discrete channel types: an input, an output, an event recording input, an event recording output, or a pulse output.

The SDM+'s inputs are current sinking (i.e. the input device is wired between the power supply positive (+) and the I/O terminal). Outputs are current sourced (i.e. the output device is wired between the output terminal and the power supply common). A pulsed output is an output channel that is on for a user-defined duration (within the range of 25 to 2000 ms and a resolution of 25 ms).

Each input and output circuit is electrically isolated from the module's CPU, IOBUS, and ground. In addition, a soft-fuse (TM) circuit protects each output channel from a short circuit in the field wiring and prevents a short from affecting other SDM+ channels. Note that a soft-fuse can be reset locally or remotely.

QUADLOG SDM+ Channel Types

The channel types supported for the SDM+ are listed here. In a DP/IO Bus Link environment, configuration information in this document supersedes information in

I/O Module and Channel Parameters

the section titled "Configuring I/O Channels" in the document [Using the ProcessSuite 4-mation Configuration Software Version 4.30 or Higher](#) (CG39-20)..

- SDM+ Disc In (ADIC)
- SDM+ Disc Out (SDOC)
- SDM+ Disc Pulse Out (DPOC)

7.10.1 QUADLOG Discrete Input (ADIC)

The Discrete Input channel type returns a BOOL variable. The table below lists the softlist parameters for this channel type.

PARAMETER	SELECTION	DEFAULT
InputFaultState	TRUE, FALSE (hidden in HW Config)	FALSE
Shutdown_Channel	TRUE, FALSE	FALSE
PulseDiagTest*	Enabled, Disabled	Enabled

*This parameter is not used in the SDM+, but is listed because its channel type is shared with other modules.

InputFaultState (hidden from HW Config, cannot be changed in HW Config): For QUADLOG input channels, Siemens strongly recommends that customers configure and use the channel driver's substitute value to ensure that the input value is safe under fault conditions. Doing so may allow out-of-range values to be input for one or two scans, but then the channel driver stabilizes to the substitute value.

The original description of **InputFaultState** is as follows:

"When an input channel has a hardware failure that makes the channel value impossible to discern, the channel reports the BOOL value configured in this softlist parameter."

Shutdown_Channel: When the Shutdown_Channel parameter is set to TRUE, a shutdown error (class 4, SSC 37, EC 31) is reported in addition to a class 2 or class 3 channel error that affects channel quality (when BAD or QUESTIONABLE quality is set). When this parameter is FALSE, the shutdown error is not reported. Based on the default configuration supplied with QUADLOG, a class 4 error causes all outputs to shut down to their de-energized state (i.e. 0 volts or 0 mA). The configuration can be changed to only shut down the affected outputs or not to shut down at all. Only channels that are critical to the process should be configured as shutdown_channels. Note that in rack-to-rack redundant systems, a switchover to the standby side, rather than a system shutdown, occurs if an I/O failure occurs. Both sides of a redundant system would have to fail for a shutdown to occur. Refer to the section titled [Shutdown Logic](#).

PulseDiagTest: This parameter is used to enable or disable pulse diagnostic testing. It is used to detect channel anomalies such as shorts in the field, channel-to-channel shorts, and channel-to-power shorts. It is an added protection measure for safety critical channels. **Channels that perform safety critical I/O functions must have this parameter enabled.** An input channel that uses this parameter must be wired to an external Safety-Related Switch

I/O Module and Channel Parameters

Adapter. This parameter is not used in the SDM+, but is listed because its channel type is shared with other modules.

7.10.2 QUADLOG Disc Out (SDOC)

The Discrete Output channel type accepts a BOOL variable. The table below shows the softlist parameters for this channel type.

PARAMETER	SELECTION	DEFAULT
ProtectedOutput	Enabled, Disabled	Enabled
Readback	Enabled, Disabled	Enabled
Shutdown_Channel	TRUE, FALSE	FALSE

ProtectedOutput: Each output can be configured to turn off all outputs in the event that a channel is intended to be off but diagnostics have determined that it is on. You may want to configure an output as ProtectedOutput if it is critical to the process or if it presents a possible hazard to personnel or equipment.

Readback: The state of an output channel is automatically “readback” by input circuitry on the same channel. The readback is used to diagnose and report faults. There are five types of faults as listed here. You can disable readback, which, in turn, disables reporting of the first four types.

1. Diagnostic Read Error
2. Output Failed ON (energized)
3. Protected Output Failed ON (energized)
4. Output Failed OFF (de-energized, blown hard-fuse)
5. Output Failed OFF (de-energized, tripped soft-fuse)

Note

As listed above, there are two possibilities for an output channel to fail off. One way is when the hard fuse blows (it is not field replaceable); the other is when the soft-fuse trips (it is locally or remotely resettable). The soft-fuse trip error cannot be disabled by the softlist.

Shutdown_Channel: When TRUE and channel quality is BAD or QUESTIONABLE, the SDM+ module disables (0 mA) all of its output channels and reports a shutdown error (Class 4, SSC 37, EC 31). Based on the default configuration supplied with QUADLOG, a class 4 error causes all outputs to shut down to their de-energized state (i.e. 0 volts or 0 mA). The configuration can be changed to only shut down the affected outputs or not to shut down at all. Only channels that are critical to the process should be configured as shutdown_channels. Note that in rack-to-rack redundant systems, a switchover to the standby side, rather than a system shutdown, occurs if an I/O failure occurs. Both sides of a redundant system would have to fail for a shutdown to occur. Refer to the section titled [Shutdown Logic](#).

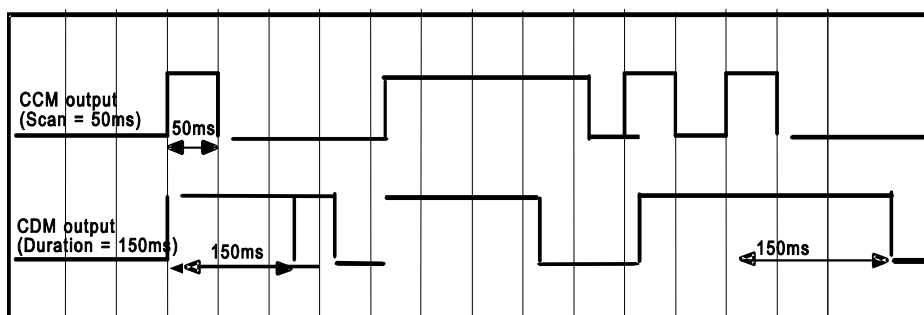
I/O Module and Channel Parameters

7.10.3 QUADLOG Discrete Pulse Output (DPOC)

The Discrete Pulse Output channel type is available in the CDM and SDM+ modules. It accepts a BOOL variable. This channel type turns on its assigned output for a pre-determined time period (the resolution of the pulse output is +/-25 ms, accurate to within +/-2 ms). The time period is established by the Duration softlist parameter value. It can be set between 25 ms and 2000 ms.

When the BOOL output value, sent from the control module to the CDM or SDM+, transitions from FALSE to TRUE, the corresponding output will turn on for the specified duration. However, if another FALSE to TRUE transition occurs before the end of the pulse, the pulse output is retriggered. Therefore, to keep a pulse output channel constantly on, you must write a FALSE to TRUE transition to the channel at a faster rate than the pulse duration.

The following timing diagram shows the output value being sent from a CONTROLLER to the CDM or SDM+. In this example, the CONTROLLER scan rate is set to 50 ms; therefore, the CONTROLLER can only change the state of the output every 50 ms. The CDM or SDM+ output is configured as a Discrete Pulse Output channel with a duration of 150 ms. The figure below shows how a FALSE to TRUE transition of the CONTROLLER output triggers a pulse output. It also illustrates that once a pulse output has been triggered, it can be retriggered before the end of the pulse duration.



The table below lists the softlist parameters for the Discrete Output Pulse channel type.

PARAMETER	SELECTION	DEFAULT
Duration	25 to 2000 ms	25 ms
Readback	Enabled, Disabled	Enabled
ProtectedOutput	Enabled, Disabled	Enabled
Shutdown_Channel	TRUE, FALSE	FALSE

Duration: The duration of a pulse output channel can be specified between 25 ms and 2000 ms in 25 ms increments. Any value not in 25 ms increments is rounded up to the next 25 ms increment, however, there is a 5 ms deadband before rounding occurs. For example, if the duration specified is 28 ms, the actual pulse will be 25ms because of the deadband. Likewise, if the duration specified is 31 ms, the actual pulse will be rounded up to 50 ms. Use the examples in tables below as guidelines.

I/O Module and Channel Parameters

EXAMPLE DURATION VALUE	ACTUAL PULSE DURATION
25 ms	25 ms
26 to 30 ms	25 ms (because of 5 ms deadband)
31 to 50 ms	50 ms (rounded up)

Readback: The state of an output channel is automatically “readback” by input circuitry on the same channel. The Readback is used to diagnose and report the following five types of faults. Disabling Readback disables reporting of the first four types.

1. Diagnostic Read Error
2. Output Failed ON (energized)
3. Protected Output Failed ON (energized)
4. Output Failed OFF (de-energized, blown hard fuse)
5. Output Failed OFF (de-energized, tripped soft-fuse)

Note

Disabling ReadBack does not disable the controller readback diagnostic. ReadBack should be enabled if Shutdown_Channel = TRUE.

As listed above, there are two possibilities for an output channel to fail off. One way is when the hard fuse blows (it is not field replaceable); the other is when the soft-fuse trips (it is locally or remotely resettable). The soft-fuse trip error cannot be disabled by the softlist.

ProtectedOutput: Each output can be configured to turn off all CDM or SDM+ outputs in the event that a channel is intended to be off but diagnostics have determined that it is on. You may want to configure an output as ProtectedOutput if it is critical to the process, or if it presents a possible hazard to personnel or equipment.

Shutdown_Channel: When the Shutdown_Channel parameter is set to TRUE, a shutdown error (class 4, SSC 37, EC 31) is reported in addition to a class 2 or class 3 channel error that affects channel quality (when BAD or QUESTIONABLE quality is set). When this parameter is FALSE, the shutdown error is not reported. Based on the default configuration supplied with QUADLOG, a class 4 error causes all outputs to shut down to their de-energized state (i.e. 0 volts or 0 mA). The configuration can be changed to only shut down the affected outputs or not to shut down at all. Only channels that are critical to the process should be configured as shutdown_channels. Note that in rack-to-rack redundant systems, a switchover to the standby side, rather than a system shutdown, occurs if an I/O failure occurs. Both sides of a redundant system would have to fail for a shutdown to occur. Refer to the section titled [Shutdown Logic](#).

Enabling this parameter also enables the controller readback diagnostic. This diagnostic compares the output value sent by the controller to the value “read back” by the CDM or SDM+.



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