

Basic Module Information for 1769 OCP-ETG - General

This "Basic Module Information" (BMI) provides quick access to a list of the main module functions, some attributes, and the location of more detailed module information.

NOTE: When developing an application, or troubleshooting a significant problem, it is **IMPORTANT** to read and follow more detailed module information, including safety recommendations and hazardous location information. The primary source of detailed module information is the 1769 OCP-ETG "Users Manual" (document #0748-1402), available from Phoenix Digital (PD). Additional information may also be available on the Phoenix Digital website, www.phoenixdigitalcorp.com, referred to in this BMI as the "PD website".

Function

The Phoenix Digital 1769 OCP-ETG Gigabit Optical Communication module is part of a family of modules from PD that provide Rockwell Automation systems with Fault Tolerant, Redundant, Self-Healing, Communication Modules.

Features of the OCP-ETG include:

- Fiber Optic Communications. . . noise immune and intrinsically safe media
 - Many fiber optic connector and fiber options; short or long distances; up to 74 miles (120Km).
 - Configurable in multidrop ring, bus, star, tree, or point-to-point networks
 - Extended Capacity option for 99+ nodes
 - Fault Tolerant, self-healing networks using redundant fiber media.
 - Continuous on-line error checking of optical components
- Ethernet 10/100/1000
 - Protocol transparent - all protocols on the same network at the same time
 - Auto-Negotiation and Auto-Crossover for ease of installation.
 - Transparent network management and switched operation of up to 2 ports per module
- Interactive Fiber Network Diagnostics.
 - Detect and locate fault conditions throughout the network
 - Verify Fault Management and overall network integrity
 - Simulate network fault conditions
 - Trap-and-hold intermittent failure conditions
- UL and UL/C Class I, Division 2 Groups A, B, C, D hazardous location rating
- CE mark for European Union Directive

Optical Network Interface

- Optical Connector Options: LC
- Optical Fiber Options: 850 nm and 1300 multimode, 1300 nm and 1550 single mode

Gigabit Ethernet Interface

The RJ45 connectors on the front of the OCP-ETG module provide independent, switched 10/100/1000 Gigabit Ethernet ports. Each port includes:

- Auto-Negotiation (speed and mode),
- Auto MDI/MDIX Crossover (cable sense),
- Built-in Cable Tester to check the physical media (refer to Troubleshooting topic in this BMI).

Module Identity

The module Identity includes the following attributes (refer to “EDS File” in Documentation topic of BMI):

Vendor ID: 420	Vendor Name: “Phoenix Digital”
Product Type: 10	Product Type Name: “Fiber Optic Comm Module”
Product Code: FC10	Product Name: “OCP-ETG”
	Catalog: “OCP_ETG Phoenix_Digital_R1.0”

Data

The following module data types and tags are created by the AOP:

- a. Input:
 - i. Assembly Instance -> 101
 - ii. Size -> 8
- b. Output: Greyed out
- c. Configuration:
 - i. Assembly Instance -> 102
 - ii. Size -> 0

Note: IO Tags are updated by the controller asynchronous to its ladder-logic program scan. When “block integrity” of this data is important, the CPS ladder instruction can synchronously copy the data to other tags for use by application logic.

Read Status Word (0=normal/inactive, 1=assert/active)

OCP Backplane Map

Word	Bit	Tag
0		Module Info
	0	Master
	1	Trap
	2	Port1High
	3	.
	4	.
	5	A_Disable
	6	B_Disable
	7	P1_Disable
	8	P2_Disable
	9	.
	10	GLB_AllGood
	11	GLB_BrkNoTrap
	12	GLB_BrkInTrap
	13	GLB_PrivBrkTrap
	14	GLB_NetwErr
	15	GLB_Off
1		Flags
	0	ARxHighAlrm
	1	ARxHighWarn

	2	ARxLowWarn
	3	ARxLowAlrm
	4	ATmpHighAlrm
	5	ATmpHighWarn
	6	ATmpLowWarn
	7	ATmpLowAlrm
	8	BRxHighAlrm
	9	BRxHighWarn
	10	BRxLowWarn
	11	BRxLowAlrm
	12	BTmpHighAlrm
	13	BTmpHighWarn
	14	BTmpLowWarn
	15	BTmpLowAlrm
2		Fiber A Info
	0	Link
	1	1G
	2	100M
	3	.
	4	SM
	5	MM
	6	.
	7	850nm
	8	1310nm
	9	1550nm
	10	.
	11	Waiting
	12	.
	13	.
	14	.
	15	.
3		Fiber B Info
	0	Link
	1	1G
	2	100M
	3	.
	4	SM
	5	MM
	6	.
	7	850nm
	8	1310nm
	9	1550nm
	10	.

	11	Waiting
	12	.
	13	.
	14	.
	15	.
4		Port 1 Info
	0	Link
	1	1G
	2	100M
	3	10M
	4	.
	5	.
	6	.
	7	.
	8	.
	9	.
	10	.
	11	.
	12	.
	13	.
	14	.
	15	.
5		Port 2 Info
	0	Link
	1	1G
	2	100M
	3	10M
	4	.
	5	.
	6	.
	7	.
	8	.
	9	.
	10	.
	11	.
	12	.
	13	.
	14	.
	15	.
6		Fiber A RX %
7		Fiber B RX %

Communication

1769 Backplane Communication

- Connected producer/consumer multicast IO communication
 - RPI = 10ms default, 10-750ms range
 - Support for multiple controllers, either "listen only" or multiple owners.
 - Local chassis operation, or Remote chassis operation (over CIP network).
- Unconnected messaging from controller (MSG instruction) or from a CIP network client. Typical uses would include:
 - Read module Identity
 - Reset the module (only the backplane ASIC gets Reset on the OCP-ETG)

NOTE: Refer to detailed protocols and MSG examples described in Studio Logix 5000 Developer Sample Projects.

Bus Power

From the 1769 backplane: 1.5A max on +5V (for sizing power supply); 1.1A typical

Basic Module Information for 1769 OCP-ETG - Configuration

Add-on-Profile (AOP)

The module functionality is configured through a custom, separately-installable Add-on-Profile within Studio Logix 5000 Developer Software. When a module from the Studio Logix 5000 Developer Select Module dialog is added to the project tree, the following items are created in the project:

- a custom Module-Defined Data Type, and corresponding Input, Output, and Configuration Tags
- a producer/consumer IO connection using the module's specific IO assemblies and sizes.

Configuration

In the case of the OCP-ETG module, the Configuration Tag is not used. Configuration is instead implemented via switches located on the module as shown below. Switch bank 1 is used Mastership and Port Priority. Switch bank 2 sets denial of service for both fiber and copper ports.

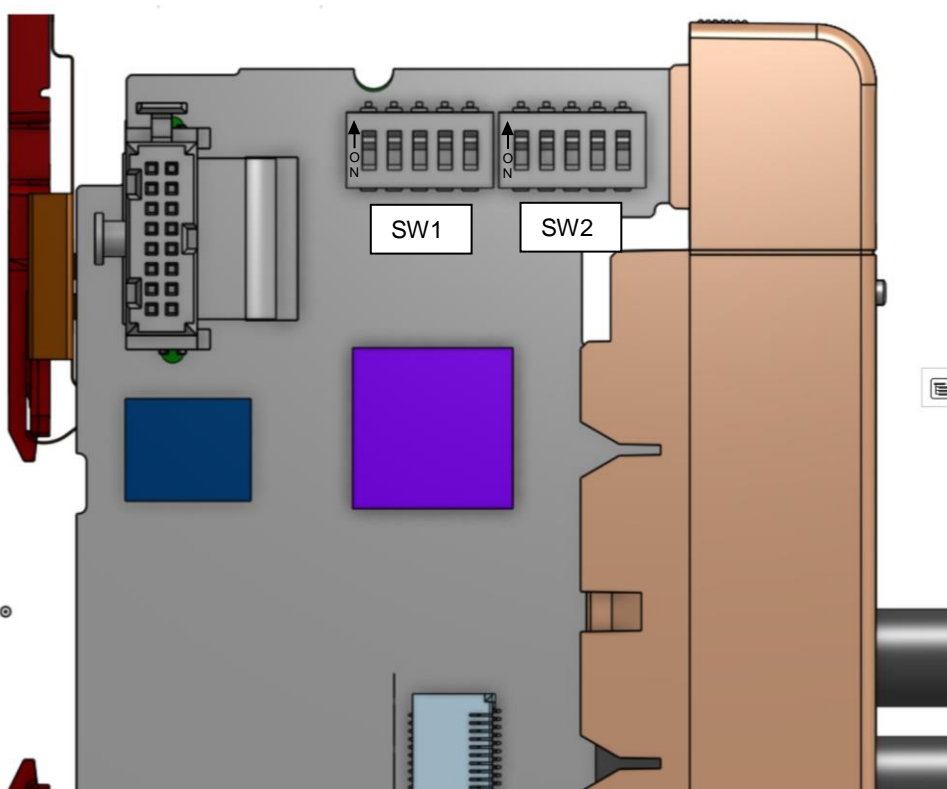
Note: Unused switch positions must remain in the Factory Default position.

Network Priority Queuing System (PQS)

The performance of the network can be adjusted to give higher priority and more frequent port/module service to the most important devices during time periods when the network is heavily loaded. The priority of individual nodes, or groups of nodes, can be selected on Rotary Switch 1, as described below. A "0" selection sets the module priority to Level 1, Standard Priority, the factory default setting. At this level, all devices connected to this module have Level 1 priority and equal access to the network. If all modules are set to Level 1, then all devices on the network have equal access regardless of network loading.

Other selections on Rotary Switch 1 will set the module to other priority levels. In some cases, certain ports on the module will be assigned higher priority than other ports. Refer to the description below of the switch settings, and refer to the Users Manual for more detailed descriptions of the PQS system.

Switch Location and Settings



Toggle Switch Map

SW1	
1	Master
2	Trap
3	Port1High
4	.
5	.

SW2	
1	A_Disable
2	B_Disable
3	P1_Disable
4	P2_Disable
5	.

- (1) See Figure above for designated switch locations
- (2) ON=Assert (Active, Switch Closed, OFF=Inactive, Switch Open).
- (3) **All unused switch positions must remain set in the Factory Default Configuration**

Basic Module Information for 1769 OCP-ETG - Sample Projects

There are currently no Sample Projects specifically for the OCP-ETG.

Locating Sample Projects

Some Sample Projects are installed with Studio Logix 5000 Developer. To locate them, select "Vendor Sample Projects" on the main RSLogix 5000 HELP menu.

Using Sample Projects

The Sample Projects can be used as a model for a separate application, as the start for a new project, or by copying or importing elements to another project. Studio Logix 5000 Developer partial Import/Export can be used to add a sample project to an existing application project. This minimizes the number of user steps involved, and provides automatic checking and handling of conflicts with the existing project (e.g. duplicate tag names, etc.). Refer to RA publication 1769-RM084K-EN-P, "Logix5000 Controllers Import/Export Reference Manual", available for download at the Rockwell Automation website (www.rockwellautomation.com).

Basic Module Information for 1769 OCP-ETG - Documentation

The primary source for detailed information about the 1769 OCP-ETG module is the “Users Manual” referred to throughout this document as the “Users Manual”. Some information may be available for download from the “PD website”.

Certifications

Certifications for this module normally include UL and UL/C (Class I, Div 2, Groups ABCD), plus CE. Refer to the markings on the module side label and to the specifications in the Owner’s Guide for more detailed information. Products with a CE mark are approved for installation within the European Union and EEA regions. The CE Declaration of Conformance (DOC file) for this module is available from Phoenix Digital.

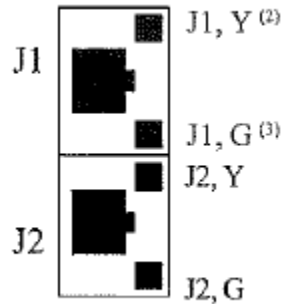
Basic Module Information for 1769 OCP-ETG - Indicators and LEDs

General Front Panel



Link Status Indicators

Dual Connector – separate Yellow and Green LEDs



(2) "Y LED" States	Status
OFF	Not receiving data
Steady Yellow	Receiving data
(3) "G LED" States	Status
OFF	No Link
Steady Green	Link established
Flashing Green	Transmitting or receiving data

Module Status Indicators

All LEDs OFF would indicate no backplane power.

"OK" LED States

"OK"	Status (action)
OFF	If no other LEDs ON, check backplane power
Steady Green	Normal - Status word is being sent over backplane to controller.
Flashing Green	Waiting - The module is ready, but is not currently performing connected communications on backplane (check configuration or controller).
Flashing Red	Connection dropped - Previously established backplane communications has timed out. (check controller)
Steady Red	Fault or Reset condition.

“ACT/ERR” LED States (Ch A, B Active/Error)

“ACT”	<u>Status (action)</u>
Steady Green	Optical receive input detects valid communications.
Steady Red	Optical receive input does not detect valid communications (check connections and state of other devices).
Flashing Green/Red	In Trap Mode, this module trapped a failure, which was repaired (network needs to be Reset to clear the trap).

“Data” LED States (Ch A, B Transmit/Receive)

<u>“Tx/Rx”</u>	<u>Status (action)</u>
OFF	Optical channel is inactive.
Steady Green	Optical channel active, but no data passing.
Flashing Green	Module transmitting on channel output.
Flashing Yellow	Module receiving on channel input.

“G ERR” LED States (requires configuration of a redundant network and Master module)

<u>“Global ERR”</u>	<u>Status (action)</u>
OFF	No Master detected on network. (check redundant configuration).
Steady Green	Redundant network fiber connections good.
Flashing Green	Network break detected and modules not in Trap Mode.
Flashing Red	Network failure trapped with network in Trap Mode.
Flashing Green/Red	In Trap Mode, a failure was trapped, which was repaired (network needs to be Reset to clear the trap).

Basic Module Information for 1769 OCP-ETG - Troubleshooting

NOTE: Before attempting to maintain or troubleshoot a system, read the detailed module information and **IMPORTANT** safety recommendations in the “Users Manual”.

Status/Diagnostics

Built-in network and fiber optic media diagnostics are included. Faults will be reflected in module indicators and in the Read Status Word.

Backplane communication with the controller is also monitored. In addition to the indicators on the module, fault conditions are indicated in Studio Logix 5000 Developer software in the following three ways:

- Warning signal on the main screen next to the module, when the IO connection is broken
- Fault message in a screen’s status line, with notification in the Tag Editor. General module faults are also reported in the Tag Editor. Diagnostic faults are only reported in the Tag Editor.
- Status on the Module Info Page

Refer to the “Users Manual” for detailed information on status and diagnostics.

Locating Network Failures

When a communication failure is detected on a receive data input, Word 2 bit 0 (ChA) or Word 3 bit 0 (ChB) of the Read Status Word is asserted and the corresponding transmit output is disabled, causing the adjacent module to also detect a communication failure. Examination of the status bits in each device enables the user to locate the failure. Refer to the “Data” section of the “General” topic in this BMI for details of the Read Status Word.

Auto-Recovery Mode (module not set to Trap Mode)

Communication errors are automatically detected, isolated, and corrected by switching the network around the failure. If the module is in Auto-Recovery Mode, when the source of the failure is corrected, the module will automatically restore the network to the original configuration.

Trap Mode (Trap-and-Hold Mode)

Trap Mode is useful for locating the source of intermittent network failures. Communication errors are still automatically detected, isolated, and corrected by switching the network around the failure, but when the source of the failure is corrected, the module does not automatically restore the network to the original configuration. Instead, the modules must be reset.

Trap Mode is set on the Network Master module, which automatically puts the entire network in Trap Mode, and no other modules need to be configured. When initially setting up a network for Trap Mode, any modules indicating Trapped state will need to be manually Reset by pushing the TM (Test Mode/ Trap Mode) front panel switch. Likewise, any time a failure is Trapped, modules will need to be manually Reset.

All redundant ring and redundant peer-to-peer networks require one device to be set to Network Master. Non-redundant, open bus, or single channel point-to-point networks don’t normally require setting a Network Master, but must include one if Trap Mode is to be used. (Note: A side-effect of using a Network Master in these non-redundant networks is that the Global Error indicator on each device will be ON. It should be ignored)

Checking Ethernet Physical Media

The Cable Tester feature checks the quality of the Ethernet physical media, including cable, connector, and terminator. It can help identify problems such as opens, shorts, impedance mismatches, and bad magnetics. The Cable Tester feature is enabled by pushing the front-panel TM (Test Mode/ Trap Mode) pushbutton when the module is not in Trap Mode. Connected devices will lose their links while the module performs TDR testing sequentially on all device ports (2-4 seconds per port). The port indicators on the RJ45 connectors will flash GREEN on success, or YELLOW on failure. Any unconnected ports will also fail the test. After the test, link communications is automatically re-enabled. Note that during a cable test, network fault management is disabled.

Module Reset

The module can be manually Reset using the TestMode/TrapMode pushbutton on the front panel (refer to

Trap Mode above). The module will be reset if chassis power is removed and restored, or if the module is removed and reinserted in the chassis under power. Refer to “Module Replacement” in the “Support” topic of this BMI for proper procedures.

A Reset can be sent to the module as a MSG from the ladder logic program (see “Sample Projects” topic of this BMI), or by clicking the Reset button on the Add-on-Profile Module Info page, but these only reset the module’s backplane interface, not the whole module.

Basic Module Information for 1769 OCP-ETG - Support

Website

Some information may be available at the Phoenix Digital website (the "PD website") at www.phoenixdigitalcorp.com. (use hotlink on AOP Vendor tab).

Contacts

For technical support, contact Phoenix Digital Corp. For contact information, refer to the PD website, or the information on the AOP Vendor tab.

Versions and FW Updates

The latest module version is 1.0 (as of May 2018). All versions of the OCP-ETG are compatible with this Add-on-Profile.

Module Replacement and RIUP

RIUP (Removal and Insertion Under Power) is supported.

NOTE: Refer to the "Users Manual" for proper procedures and Safety recommendations. Arcing could cause an explosion in a hazardous location installation. Refer to **Warnings** in "Users Manual" relating to use in Class 1, Div 2 hazardous locations.

NOTE: Proper handling precautions must be used to avoid damage to electronic components from Electrostatic Discharge.

Module configuration is set via switches on the module. When a failed module is replaced it is important to set the switches to the same positions.

Module Repair

Contact Phoenix Digital for policies and proper procedures for returning a product to Phoenix Digital for service.

Basic Module Information for 1769 OCP-ETG - About

This "Basic Module Information" is part of the Phoenix Digital OCP-ETG module Studio Logix 5000 Developer Add-on-Profile (AOP) software. Refer to the AOP End-User-License-Agreement (EULA) for restrictions.

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