![ASCENT Communication Technology logo]

**AT5000 ARQR**

**Quad RFoG
Return Receiver**

**Quick Reference
Guide**

**Revision B**

# ACT AT5000 ARQR Quad RFoG Return Receiver

# Quick Reference Guide

ACT Document Number: AT5000 ARQR QRG Revision B

This document is produced to assist professional and properly trained personnel with installation and maintenance issues for the product. The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice.

For more information, contact ACT:   Sales@ascentcomtec.com



# Revision History

| Revision | Date | Reason for Change |
|:---:|:---:|:---|
| A | 02/01/2012 | Initial Release |
| B | 09/01/2015 | Section Update |

# Contents

# 1   Precautions

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WARNING!

Access should be restricted to trained personnel only. Do not view exposed fiber or connector ends when handling optical equipment.

</div>

- Ensure adequate cooling and ventilation as specified.
- The installation and operation manual should be read and understood before units are put into use.
- Always replace protective caps on optical connectors when not in use.
- The typical connectors fitted are SC/APC 8°.  **Note:** 8° angle polished connectors must be used.

## Cleaning

Use only a damp cloth for cleaning the front panel. Use a soft dry cloth to clean the top of the unit.
Do not use spray cleaner of any kind.

## Overloading

Overloading wall outlets and extension cords can result in a risk of fire or electric shock.
Use approved electrical cords.

## Damage requiring service

Unplug unit and refer servicing only to Ascent Communication Technology qualified service personnel.

## Servicing

Do not attempt to service this unit yourself.  Refer all servicing only to Ascent Communication Technology qualified service personnel.

# 2 Introduction

## 2.1 Overview

AT5000 1RU Quad Return Receiver offers a flexible, low noise, high performance return receiver platform for regular CATV or RFoG return path application and long distance CWDM/DWDM return data transmission for digital CMTS services in CATV networks. Together with ACT 1RU AT5000 XMOD and EDFA optical amplifiers, the 1RU ARQR return receiver provides an ideal long distance video and short, medium video overlay solution in traditional HFC network and also high density FTTX networks to bring back the data signal from business and subscriber home premises.

AT5000 1RU Quad Return Receiver is designed with four independent optical receiver modules in one pizza box platform, converting upstream optical signals into RF at the headend or remote hubs. AT5000 ARQR incorporates the low noise PIN detector and RF amplifier chain. Internal selectable RF attenuators can be adjusted to achieve flexible output power.  Good link performance enables DOCSIS 3.0 upstream bonding on PON architectures.

AT5000 ARQR receiver is equipped with intuitive front panel LCD display to make operator's life easier. The optical receiver is packaged in a self-contained 19" sub-rack of 1 RU with universal mains power supply and SNMP management.

## 2.2    Features

- Compatible with FTTX PON, EPON, GPON, BPON, DPON application

- High Performance, Low Noise RFoG Return Receiver

- Four Independent Receivers in 1RU Chassis

- Bandwidth 5~100MHz

- Suitable for RFoG or long distance return CWDM/DWDM applications

- Dual redundant hot-swappable AC or DC power supplies

- Front-panel LCD for local monitoring of transmitter status

- Local or remote monitoring and configuration

- SNMP/HTTP monitoring, management and control
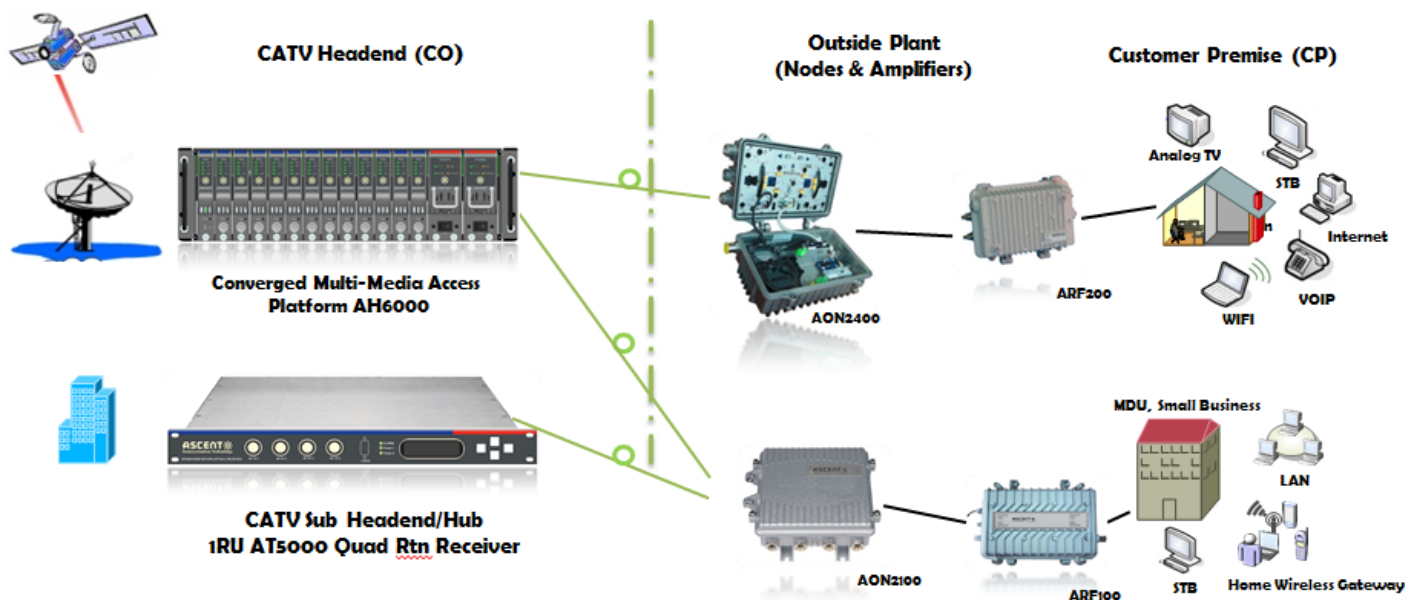
## 2.3    Specifications

### Optical Specifications

| | |
|---|---|
| Wavelength | 1200~1620nm |
| Optical Input Ports | 4 or 8 |
| Optical Input Level | -17 ~ -7dBm; -27 ~ -13dBm (RFoG) |
| Optical Input Sensitivity | -23dBm, -34dBm(RFoG) |
| Optical Return Loss | 50dB |
| Optical Connector | SC/APC |

### RF Specification

| | |
|---|---|
| RF Bandwidth | 5~200 MHz; 5~100 MHz (RFoG) |
| RF Flatness | +/- 0.75 dB |
| RF Output Level | 30 to 60dBmV |
| RF Gain/Attenuation | 0 to 18dB |
| RF Return loss | ≥ 16 dB |
| RF Input impedance | 75 Ω |
| RF Test Point | -20 dB +/- 0.5dB |

### Link Performance

| | |
|---|---|
| NPR | 36dB  (FP, 15dB link loss )<br>40dB  (DFB, 15dB link loss ) |

### General Specifications

| | |
|---|---|
| Operating Temp, °C | 0 to 50 |
| Storage Temp, °C | -40 to 85 |
| Operating relative humidity, % | 5 to 95 |
| Power Consumption W | ≤12 |
| Power Supply | Dual AC 110 to 265VAC, or -30 to -72VDC |
| Dimensions (W x D x H) | 480x305x44 mm |
| Weight, kg | 5 kg |
| Ship weight | 5.5 kg |

## 2.4    Models and Options

| AT5000 ARQR Series | Description |
|---|---|
| AT-50-ARQR-SC-AC | AT5000 1RU Quad Return Receiver 4 optical input, SC/APC connectors, AC PS |
| AT-50-ARQR-RG-SC-AC | AT5000 1RU Analog RFoG Quad Return Receiver 4 optical input, SC/APC connectors, AC PS |
| AT-50-ARQR-RG-SC-DC | AT5000 1RU Analog RFoG Quad Return Receiver 4 optical input, SC/APC connectors, DC PS |

# 3    Installation

## 3.1    Equipment Inventory

On receiving your new ARQR, you should carefully unpack and examine the contents for loss or damage that may have occurred during shipping. Refer to warranty registration if loss or damage has occurred. The ARQR pack will consist of the following:

| Qty | Description |
|-----|-------------|
| 1 | ARQR, Analog Quad Return Receiver |
| 1 | Product user manual (optional) |
| 1 | Power supply cord |

## 3.2    Packaging and Transportation

Keep all packing boxes and packaging of the ARQR for future transport.

Use only the original packaging of the ARQR when transporting. This packaging has been specifically designed to protect the equipment.

## 3.3    Power and Cooling Requirements

The ARQR requires an input of 90 to 264 Vac at 50/60 Hz. The mains input socket on the unit is IEC configuration. Over-load and over-voltage protection is included in the unit, which may cause it to shutdown in extreme circumstances. If this occurs, remove the fault condition and the system will recover automatically.

The unit should be located in an environment not exceeding a temperature range from 0 to 50 ºC. The internal temperature should never reach 70 ºC. If the temperature exceeds the above limits, the unit should be relocated in the equipment rack where the ambient temperature will be less than 50 ºC.

## 3.4    Module Installation and Adjustment

The following steps explain how the ARQR is to be installed. Please read them carefully:

Unpack the optical return receiver and inspect the unit as stated in **Section 3.1**.

Locate the optical return receiver in a 19" cabinet, ensuring adequate space for accessing the rear ports and front-panel keypad.

Prior to connecting any fiber patch leads to optical transmission equipment, always ensure that the ends of the fiber optic connectors are clean and free of contaminants.

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### WARNING!

**Do not view exposed fiber or connector ends when handling optical equipment.
Exposure to invisible laser radiation may cause permanent eye damage.**

</div>

Connect the optical input ports to the system.

Always place protective dust caps on all optical ports when not in use.

Connect the optical input signal to the input port of the ARQR.

**Ensure the input optical power is within the range of -17 to -7dBm with the typical value at -12dBm.**

Use the supplied power cord to apply mains power to the receiver

See **Section 5** for instructions on how to view the status information about the ARQR.

## 3.5     Front Panel Layout



| Item | Description | |
|------|------------|---|
| **1** | LCD | LCD to display user interface. |
| **2** | KEYPAD | Keypad for navigating menus and making selections with the user interface. |
| | | 1.selection button |
| | | 2.change value button |
| **3** | ATT | RF output adjustment 0~18dB |
| **4** | Input Power Level | Input Power higher than -7dBm red |
| | | Input between -17dBm and -7dBm green |
| | | Input Power below -17dBm No Light |

## 3.6    Rear Panel Layouts
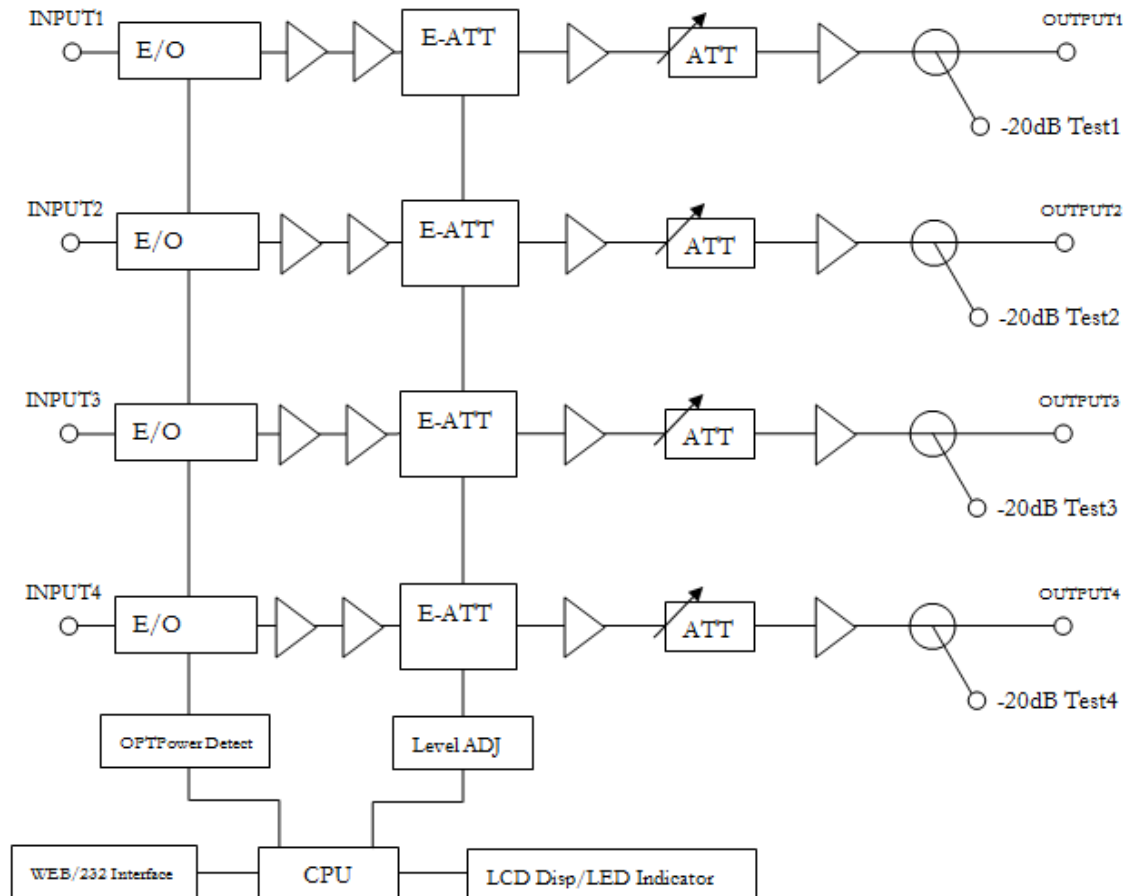


| Item | Description | Operation |
|---|---|---|
| 1 | Optical Input and Opt In LED | Optical Input Port 1/2/3/4 (SC/APC) |
| 2 | RF Test Point | Test Point 1/2/3/4 for RF output -20dB, F Connector |
| 3 | RF Output Port | RF Output Port 1/2/3/4, F connector |
| 4 | WEB Interface | Ethernet IP communication ports for status monitoring. |
| 5 | RS232 | RS232 Serial Port |
| 6 | FAN | FAN Module |
| 7 | IEC Main Input Power | Mains input power, 90~265 Vac, 50 / 60 Hz, IEC input with power on/off switch |

# 4    Technical Description

## 4.1    Overview

The ARQR comprises an Optical Gain Block, Control Board, and serial interface.



The Control Board monitors and controls the Optical Gain Block and feeds the front-panel LED indicators as shown in **Section 3.5**.

# 5   Software Description – Operation

## 5.1     ARQR Program Structure

The laser transmitter's software is fully automatic and constantly monitors parameters as outlined in **Section 5.4**. These parameters are stored in the unit's EEPROM and/or microcontroller. Some may be changed via external communications.

The unit is designed for local and remote monitoring and control, with WEB GUI and SNMP support.

### Factory Defaults / EEPROM Settings

The software uses EEPROM for memory back up of the lower and upper alarm limits for analogue parameters and for control variables as set by the user.

These settings will be saved into EEPROM so that the user will not need to reset these in case of a power failure.

The factory default setting of the unit is to have an IP address of **192.168.001.050**. user name:admin, password: ascent.

### Management and Control Software

Current production ARQR models are compatible with ACT HFC network management software.

## 5.2 Programming Sequence for ARQR

Press SELECT button will display below menu in sequence.

Menu # 1 -        S/N

Read-only menu, **display** the serial-number

Menu # 2 -        INPUT 1~4

**Read-only menu, display** the input optical power

Menu # 3 -        UNIT TEMP

Read-only menu, **display** the system temperature

Menu # 4 -        +5V Reads

Read-only menu, display the voltage +5V

Menu # 5 -        -5V Reads

Read-only menu, display the voltage -5V

Menu # 6 -        +24V Reads

Read-only menu, display the voltage +24V

Menu # 7 -        IP

Adjustable list, display the IP address of SNMP

Menu # 8 -        Submask

Adjustable list, display the address of net mask

Menu # 9 -        Gateway

Adjustable list, display the gateway address of SNMP

Menu # 10 -        Trap Addr 1

Adjustable list, display the TRAP1 address of SNMP

Menu # 11 -        Trap Addr 2

Adjustable list, display the TRAP2 address of SNMP

### 5.3    IP Address Configuration

- Press ▲\▼ key to amend the IP address menu that needs to be amended. Press ▲▼ at the same time to enter the menu, press ▼ to choose the amended place, push ▲ to amend, and then press ▲ ▼ to enter into save and exit.

- For example, amend IP setup menu, IP: 192.168.000.015; if you want to change 5 to 6, use ▲▼ to enter the IP menu, then press ▼ to choose the place of 5, press ▲ key to change 5 to 6, and then press ▲▼ to save amended IP:192.168.000.016

# 6    Troubleshooting

## 6.1    Fiber Optic Maintenance

Any time the fiber leads to the amplifier are disconnected, there is the potential for contamination of the ends of the fiber connectors. Dirt or other contaminants on these components can reduce the amplifier's performance and can result in permanent damage to the device. It is recommended that the fiber connectors be cleaned prior to connection, or reconnection, to the system.

## 6.2    Troubleshooting Conditions

*No lights ON*                Is the power on?
                             Is the fuse OK?

*Pin fail ON*                 Is the optical input power too low?
                             Is the input connector dirty?

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