

RCS

CommStar
Network Control Units
CS48

INSTALLATION MANUAL

Revision 3.1

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Welcome to CommStar

Your Gateway to the Automated Home or Office

CommStar is a powerful interactive automation system that integrates control of the different subsystems throughout a home or business including Lighting, Security, Entertainment (Audio/Video), Communications, Heating/Cooling, Irrigation, etc. The system can be controlled by computers, X10 controllers, in-wall keypads, wireless keypads (RF remotes), infrared remotes, analog and digital inputs and time/event schedule.

CommStar features include:

- **2-Way X10 Communication** - Sends and Receives standard and advanced X10 signals for control of lighting and appliances.
- **2-Way SERIAL Communication** - Sends and Receives ASCII via three RS-232 ports.
- **RS-485 CommStar Network Port** for connection to RS485 serial devices (Thermostats, Keypads, I/O boards).
- **2-Way IR Communication** - Sends and Receives infrared signals (with optional InfraRed Xpander™) for control of audio, video, home theater, and other infrared-operated equipment.
- **16 Digital Inputs** – Contact or Voltage input.
- **8 Analog Inputs** – 8 bit A/D channels
- **8 Relay Outputs** – SPDT 2A Relays
- **Expansion Port** - Up to 4 additional I/O boards can be connected.
- **Built in Battery Backup** - saves your schedule in case of power outage.
- **External Battery Backup** - allows connection of 12V battery (optional) to maintain system operation during power outages.
- **Real-time clock/calendar** - automatically adjusts for Daylight Savings and Leap Year.
- **SunRise/SunSet calculations**
- **X10 Sequence Feature** - A series of X10 commands within a defined time window can trigger an Event. For example, pressing A-1 A-2 A-1 within 3 seconds could dim the lights.
- **Message Log** - Your schedule can log any Event you specify with a time-date stamp attached
- **Security Mode** - Have your front porch light (and/or other devices) come on at 'approximately' the time you specify.
- **Power Fail Catch-up** - returns devices to their scheduled state when power fails, and is then restored.

What's Included

In addition to this manual, your CommStar package contains:

- One CommStar Network Control Unit
- One AC power adapter
- One 4-Conductor Modular TELEPHONE style cable
- One 6-Conductor Modular DATA cable
- One RJ11-DB9 adapter
- One Power line Interface Two Way Module (PSC05 or TW523)
- WinEVM Event Manager Software Manual and Program Diskettes

What you need

- An IBM PC-AT or 100% compatible computer capable of running Microsoft Windows, with an asynchronous serial port.
- A 3.5" high-density floppy disk drive for software installation.
- A hard disk with at least 1.6 mega-bytes available or a high capacity floppy diskette drive.
- Microsoft Windows 3.1, Win95, Win98 or Win2000.

Installing CommStar

Choose a mounting location accessible to (a) a continuously powered ac source, (b) system ground (preferably the same ground point used for the telephone network interface) and (c) telephone lines. Remove appropriate knockouts for cables.

Place the panel at a convenient viewing height and mark the mounting holes. Attach the enclosure using screws suitable for the mounting surface.

Grounding: If possible, connect the main-board Earth-Ground lug to the same ground point used for the telephone network interface. Otherwise, connect it to a long steel or copper ground rod driven deeply into the earth. Do not use a gas pipe, plastic pipe or ac ground connections. Use at least 16-gauge wire. Make the run as short and direct as possible.

1. Turn off your PC.
2. Plug one end of the modular DATA cable into COMMSTAR **COM1** port.
3. Plug the other end of the modular DATA cable into the RJ11-DB9 adapter then into your PC's serial port (use the DB9-DB25 adapter if needed).
4. Plug one end of the modular TELEPHONE type cord into the Power Line Interface module.
5. Plug the other end of the cord into the COMMSTAR jack labeled "P.L.I.".
6. Plug the Power Line Interface into an AC outlet.
7. Connect a pair of wires (22 gauge) from the "~ AC " POWER INPUT terminals to the plug-in power supply.
8. Plug the power transformer into an AC outlet.
9. Restart your PC.
10. If operation during power outages is required, connect a 12V RECHARGEABLE BATTERY (4Ah or greater) to the "BATTERY +12V" and "BATTERY GND" terminals. For best protection and power outage immunity, connect the power transformer to a UPS (Uninterrupted Power Supply).

Note: Do not plug the X10 Power Line Interface into a FILTERED outlet or power strip or UPS. This will degrade or prevent the X10 signal from getting through.

Serial Com Ports

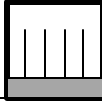
COMMSTAR has three RS-232 serial com ports. **Com1 is for reserved for connection to a PC** for use with the WinEVM software. Com2 and Com3 are for connections to modems or other serial devices under program control. Setup of these ports is performed under WinEVM.

Serial Com Port Cables

The following diagram will assist you in making your own serial data cables for connecting to the Com ports.

COM1, COM2, &
COM3 Serial Port
Pinouts

1 2 3 4



Board edge view
(looking into
connector)

- 1 - transmit
- 2 - ground
- 3 - receive
- 4 - no connection

X10 PLI Port

The PLI port is for the X10 power line interface module. Be sure to use the Two-Way module provided (PSC05 or TW523). The connection between the PLI and the CommStar PLI port is via the 4-wire **reversing** phone cable provided. If you make your own cable, be sure the wiring is reversing when viewed with the two ends side by side.

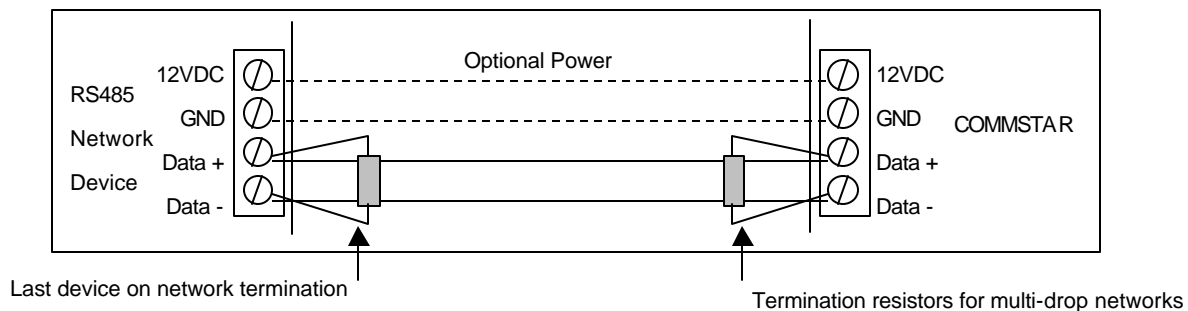
AUX Port

The AUX port is for connection to I/O-Xpanders or the IR Xpander. Up to four devices can be connected to the port. The Xpander devices come with the expansion cable to connect to the COMMSTAR.

RS485 Port

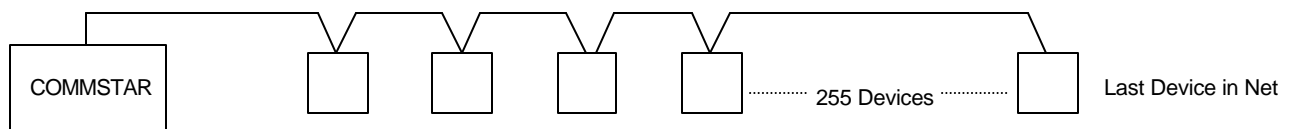
The RS485 port supports RS485 network devices such as Thermostats, Keypads and I/O devices. Up to 255 devices can be connected to the network. This Port is a half duplex 2 wire network (Data+, Data-). Optional 12VDC power can be provided for network powered devices. RS485 devices communicate at 9600 baud.

Always connect Data+ to Data+ when connecting 485 network devices.

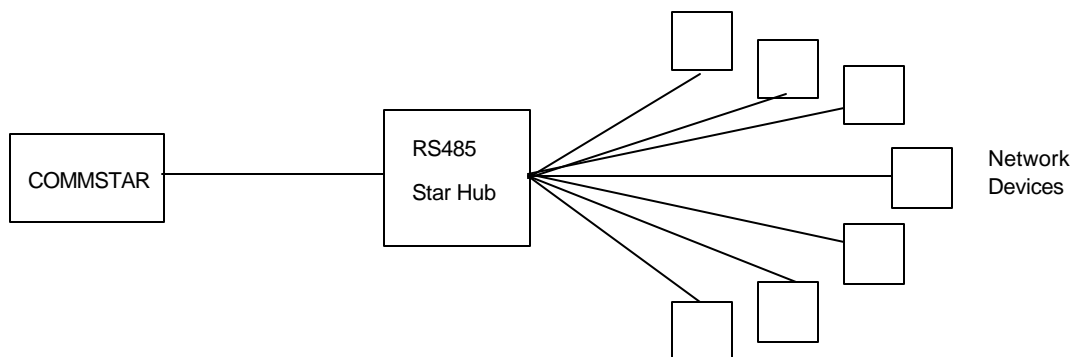


RS485 Networks

RS485 Networks are Multi-Drop or Daisy Chain networks. The correct wiring topology is to wire from one device to the next in a serial method. Termination (100 ohm resistor across Data+ and Data-) is required at each end of the network, typically one at the COMMSTAR and one on the last device on the network.



An alternate method of wiring is to wire in a star topology, that is, a homerun from each device back to the CommStar. This method requires using a RS485 Star Hub. Each device is on its own cable (typically a CAT 5 Twisted Pair Cable) that can be 4000 ft in length.



COMMSTAR LED Indicators

The COMMSTAR Main Board contains four LED status indicators that indicate various COMMSTAR modes of operation.

RUN - (red) Flashes to indicate schedule is running. The RUN LED flashes once per pass through the Schedule. The flash rate is dependant on Schedule size, the larger the Schedule, the slower it will flash.

XMIT - (green) Normally on. It will flash when COMMSTAR transmits an X-10 command.

REC - (yellow) Normally on. It will flash when COMMSTAR receives an X-10 command.

Note: both XMIT and REC will flash continuously at a 1-second interval if the power Line Interface is not plugged in and attached to the COMMSTAR.

ACTIVE - (red) Normally on and flashing. This LED indicates that COMMSTAR's processor is running (even if the schedule is stopped) and should always be flashing once/second when COMMSTAR is powered up.

Installing WinEVM Software

To use the WinEVM software with COMMSTAR, you must load the program onto a PC and connect the COMMSTAR to the PC's Com port.

Before installing WinEVM, you should copy the distribution disks onto a set of working disks, then store the original disks for safekeeping.

WinEVM comes with an installation program that will copy the various parts of the WinEVM software onto the drives and directories that you specify. The program's menus and prompts will lead you through the install process.

Refer to the WinEVM Programming Manual (DCN: 141-00550) for additional information.

WinEVM Install

Start Microsoft Windows.

1. Insert Setup Disk1 in drive A.
2. From Program Manager (Windows 3.1X), select File menu and choose Run, or Win9X/2000 select START and choose Run.
3. Type a:\setup and press ENTER

A comprehensive installation/setup program will take over at this point. You will be prompted for directory information, drive, etc. Each prompt will contain default (recommended) information.

WinEVM Setup

After the Install program is done, select the **WinEVM Setup** program (from the COMMSTAR program group) to allow you to set Event Manager parameters. Select the PC Com port that is attached to COMMSTAR, your Latitude and Longitude (look up in Appendix A of WinEVM manual) and your Time Zone.

Starting WinEVM

After connecting all cables and completing the Setup program it is time to start the Event Manager Software and test communications.

Win9X/2000: Select START, then select PROGRAMS, then select COMMSTAR, then select COMMSTAR WinEVM.

Event Manager will load your **Device DataBase** and the last Schedule that you were working on.

Note: *If this is the first time you have used Event Manger, no **Device DataBase** will exist and a blank one will be created for you.*

WinEVM Communication to COMMSTAR

Testing Communication between WinEVM and COMMSTAR

Once WinEVM is up and running on the PC, we need to verify that WinEVM and COMMSTAR are communicating.

1. Select **Utilities | System Info** from the WinEVM main menu or Click on **Sys Info** button.

Either the System Info window will open or a Communication Error message will appear.

2. **Success!** If the System Info Window opens, showing the various system parameters, you have confirmed that the communications path between your PC/WinEVM and COMMSTAR is working.
3. **Communication Error!** If this window appears, WinEVM cannot communicate with the COMMSTAR.

If you have a communication error, check the following conditions:

1. Make sure you have specified the correct PC Com port. Go to Utilities|Options and confirm Serial Port selection.
2. Be sure you are connected to the COMMSTAR **COM1** port with a Data Cable.
3. Windows cannot support shared hardware interrupts. Since COM1 and COM3 (also COM2 and COM4) typically share the same interrupts, you cannot have one serial device installed on COM1 and the other device installed on COM3 (or one device on COM2 and another on COM4).
4. If your pc has an external modem, check that it is connected to a serial port. If you have an internal modem, check the switch setting (on the board) to ensure that it is assigned to the appropriate COM port.
5. Select the Serial Port option from the System menu to check that your specification of the COM port is correct. If you cannot start WinEVM, use an editor to display the C:\WINDOWS\WINEVM.INI file. There is a line under the section entitled [WinEVM] that should appear as: SerialPort = n, where n = 1 to 4.
6. There are a number of TSR (Terminate and Stay Resident) programs that are provided with voice fax modem boards. If you have installed another software package that utilizes your board, make sure this program is not running when you start Windows. If it is still running, it will assume control of the Com Port and no other programs will have access to this port. Check your AUTOEXEC.BAT file to ensure that the program is not loaded during the boot up routine.

WinEVM Connection to COMMSTAR

Once communications to the COMMSTAR have been established, WinEVM provides the functions to define devices, create Schedules and directly monitor and control COMMSTAR devices. Refer to the WinEVM Programming Manual for detailed descriptions and instructions on using WinEVM to control COMMSTAR and it's devices.

Once a Schedule has been downloaded from WinEVM to COMMSTAR, it is not necessary for the PC/WinEVM to stay connected to COMMSTAR. WinEVM can be left connected to monitor COMMSTAR operation if desired.

COMMSTAR Self Test

You can run a Self Test of the COMMSTAR from WinEVM. Select **Utilities|Self Test** and start the Self Test. The results of the Self Test will be displayed.

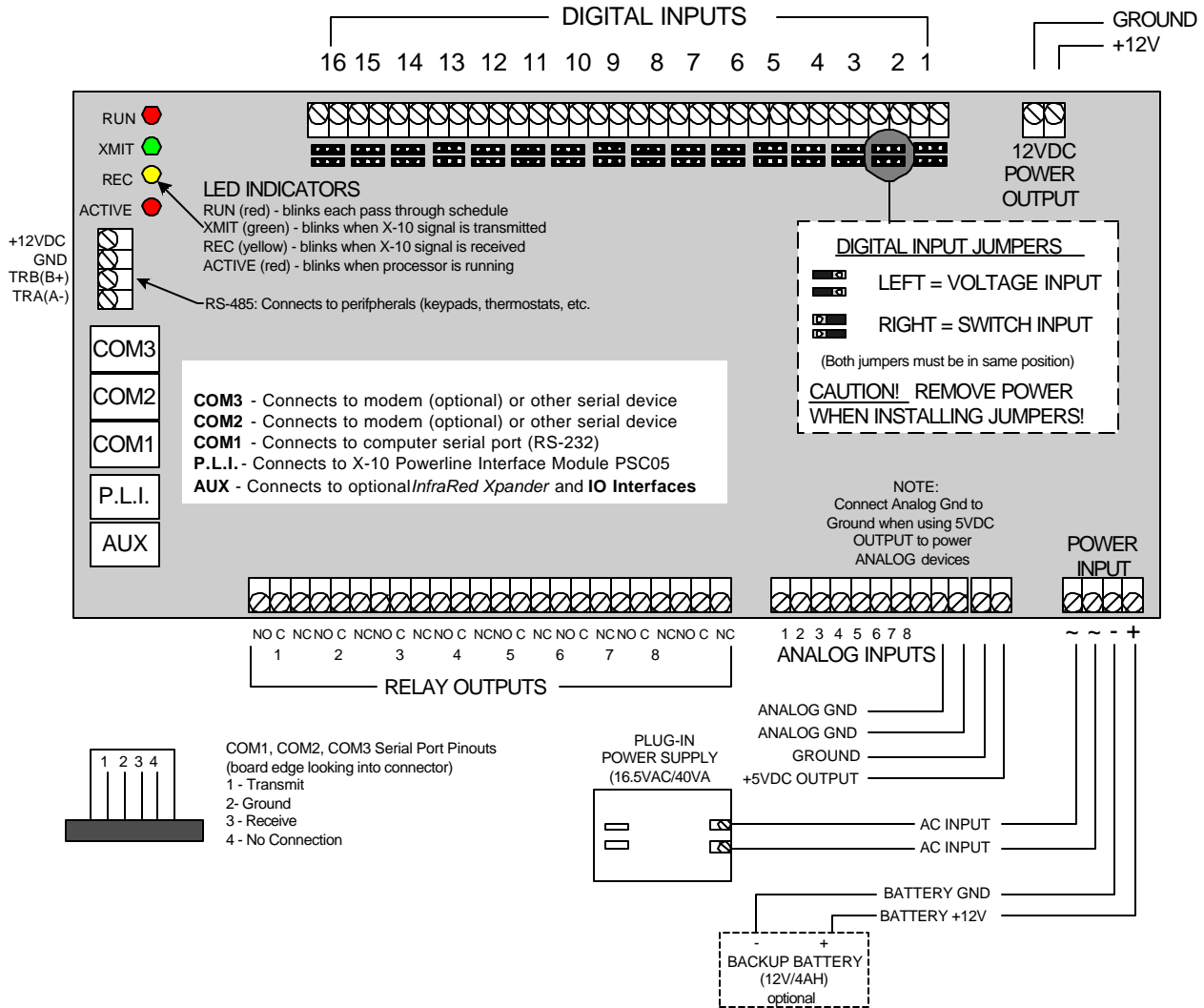
Note: If you have a schedule loaded, it will be overwritten by the Self Test and will have to be reloaded.

Mega Controller

The Mega Controller can be used to monitor and directly control many functions of the COMMSTAR and devices connected to it. Select **Utilities|Mega Controller** or click on the **Mega Controller Icon** button. The Mega Controller functions are described in the WinEVM Programming Manual.

CommStar Specifications

CS48 Panel



CS48 Electrical Specifications

Power Supply	16.5VAC @ 40VA, Plug-In Transformer
Transmission Rate:	9600 bps asynchronous
Data Format:	8 Data Bits, No Parity, One stop Bit
Connectors(RS-232)	(3) COM1, COM2, COM3
Screw Terminals	Power Input, Power Output, Digital Inputs, Analog Inputs, Relay Outputs, RS-485
Compatibility	IBM or compatible w/asynchronous serial port
Required Operating System	Windows 3.1x or Win95
Required Disk Space	3 Mbytes
Physical Size:	15" Height, 11" Length, 4" Width

Digital Inputs

Quantity	16 (expandable to 80)
Type	Non-polarized, opto- isolated
Isolation &	500 V channel-channel channel-ground
Input Range	4-24V DC or AC (50-1,000 Hz)
Input Resistance	470 ohms min
Response Time	100 milliseconds typ, requires pulse width of 100 milliseconds

Analog Inputs

Quantity	8 (expandable to 40)
A/D Type	Successive approximation
Resolution	8 bit (20mV/bit)
Input range	0-5 V(uni-polar)
Filtering	none
Conversion Time	20us type, 30us max
Linearity	+/- 1 bit
Accuracy	0.2% of reading +/- 1 bit
Input Current	100 nA max at 25 degrees C

Relay Outputs

Quantity	8 (expandable to 40)
Contact Rating	2A @ 24 VDC
Contact type	Gold overlay silver
Contact resistance	100 milliohms max (initial)
Contact arrangement	SPDT
Operating time	20 milliseconds max
Release time	10 milliseconds max
Life rating	Mechanical: 10 million operations min Electrical: 100,000 min @ full load

CommStar Programming Specifications

X-10 Devices	256
Timers	32
Time Labels	32
Flags	256
Variables	256
IF Macros	16
THEN Macros	256
Thermostats	32
IR Commands	500 (with optional JDS InfraRed Xpander™)
Lines of Code	approx. 6000-8000 (based on actual schedules, each IF condition or THEN action uses different amounts of memory)

Power Failure

COMMSTAR has a built-in battery backup that allows it to retain its memory in case your house has a power failure, or you decide to move COMMSTAR to another location. COMMSTAR can also detect when you have had a power failure and let you act on it.

When the power goes off in your home, most of the X-10 type equipment will go off, when power comes back on, COMMSTAR may think these devices are still on, creating an out of sync problem. Another scenario is if during the time the power was out, your schedule was supposed to turn a device on, since power was not on at the time the device was to turn on, it never did.

For example, assume you had a light scheduled to turn on at 6:15:

From 6:00 to 6:30, there was a power failure:

When the power comes back on, the light will be off because it never got the ON command at 6:15.

COMMSTAR knows that the power failed and will do the following:

- Play catch-up to the current time and force any X-10 device that has it's 'Power Fail Catch-up' flag set, to the state it would have been in had the power not gone out.
- Set the 'Power-Fail' variable for use in the Schedule.

During Power Fail Catch-up, the yellow and green LED's will flash steadily, after catching up, both LED's will be on solid.

The Catch-up time will depend on how long power was out and how large your schedule is.

Trouble Shooting

BEFORE YOU CALL...

The following pages describe the most common questions posed to Technical Support. Each symptom is followed by the most common cause for each problem. Before calling Technical Support for further assistance, please try the list of suggestions that relate to your problem.

Once you have tried the suggestions and the symptom persists, be ready with the following information when calling Technical Support:

1. Be at your PC and have Event Manager running.
2. Note the firmware and Event Manager versions.
3. Firmware version is reported by selecting **Utility | System Info** and WinEVM version by selecting **Help | About**.
4. The type of PC you are using: 386, 486, Pentium.
5. A short description of the problem and any error messages that appear.

You can contact Technical Support at the following phone numbers:

TEL 916-635-6784 or FAX 916-635-7668 or email: support@resconsys.com

If you decide to contact us by fax or email, please include your daytime phone number with the information requested above. The more information you include about the symptom, the easier it is for us to respond quickly and as accurately as possible. Don't forget to include your return fax number, including area code!

Common Problems and FAQ's

I keep getting Communication Errors

Check that you have the correct serial port selected. Also check that the COMMSTAR is connected properly.

Make sure that this serial port is not in contention with another serial port. Note that com1 and com3 share an interrupt and com2 and com4 share an interrupt. This means that if COMMSTAR is connected to com1, you cannot be using another serial device on com3, such as a mouse. If this is the case, change the serial port that COMMSTAR is connected to and change the serial port options.

When I look at 'System Info' my longitude and latitude are wrong

You must change the Time Parameters in the UTILITIES | TIME/DATE SET menu for COMMSTAR to know your location.

The SunRise and SunSet calculations are wrong

Make sure you have the correct longitude, latitude and Time Zone for your location listed in the TIME/DATE SET menu. This information is used to calculate the correct SunRise and SunSet times.

My Mouse does not work with Event Manager

If you have a serial mouse, check that it is not using the same serial port that Event Manager uses to communicate to COMMSTAR. They cannot use both com1 and com3, or com2 and com4 because com1/com3 share the same interrupt and com2/com4 share the same interrupt. You must use either com1 and com2, or com3 and com4 for the mouse and COMMSTAR respectfully.

I have a Mouse but I don't see the Mouse cursor

Event Manager checks your system to see if a mouse driver is loaded. If no mouse driver is loaded, Event Manager will disable the mouse so you would not see a mouse cursor. Check your config.sys file to make sure you are loading your mouse driver.