PCC 2100 Connections to ATS – rev 2

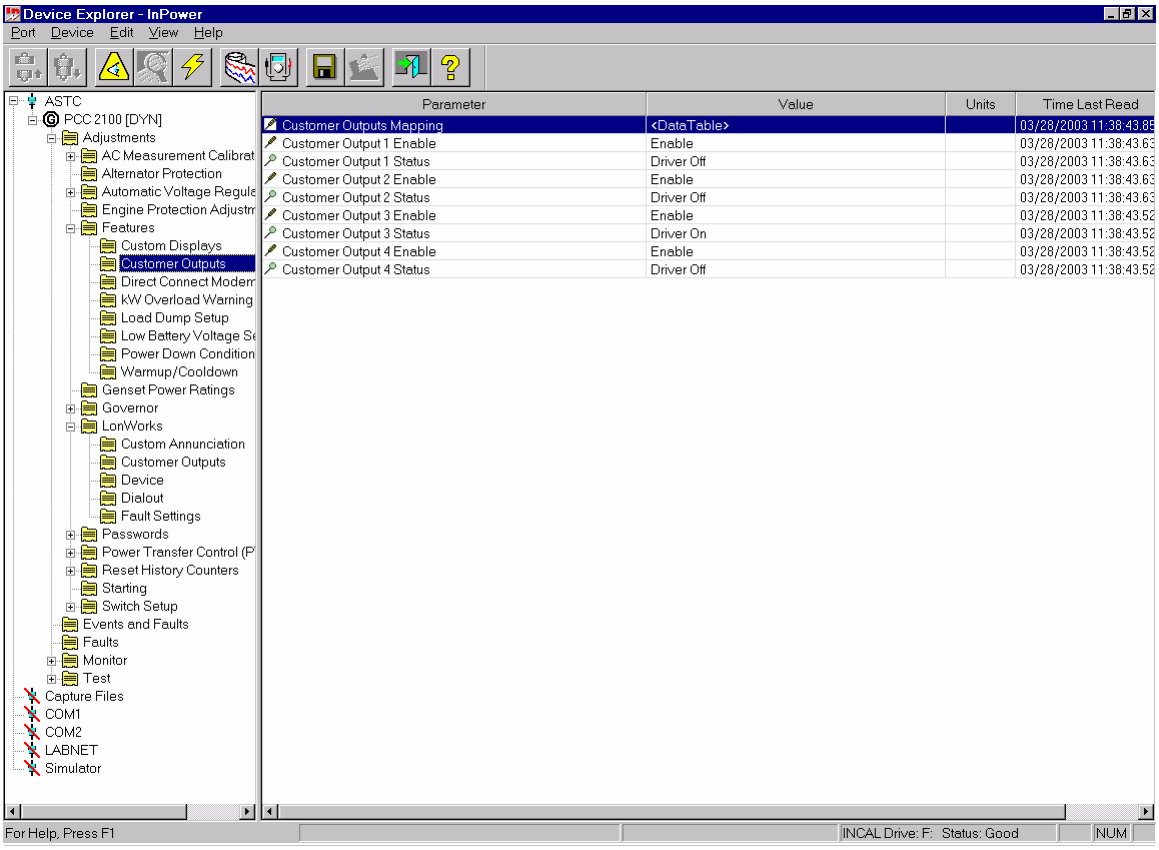
In this course we'll discuss the setup and bindings PCC 2100 for annunciation using both networked and non-networked transfer switches. We'll also review binding with DIMs, reading system data and general PCC2100 configuration and binding techniques.

Section 1. Review of PCC 2100 configuration with InPower

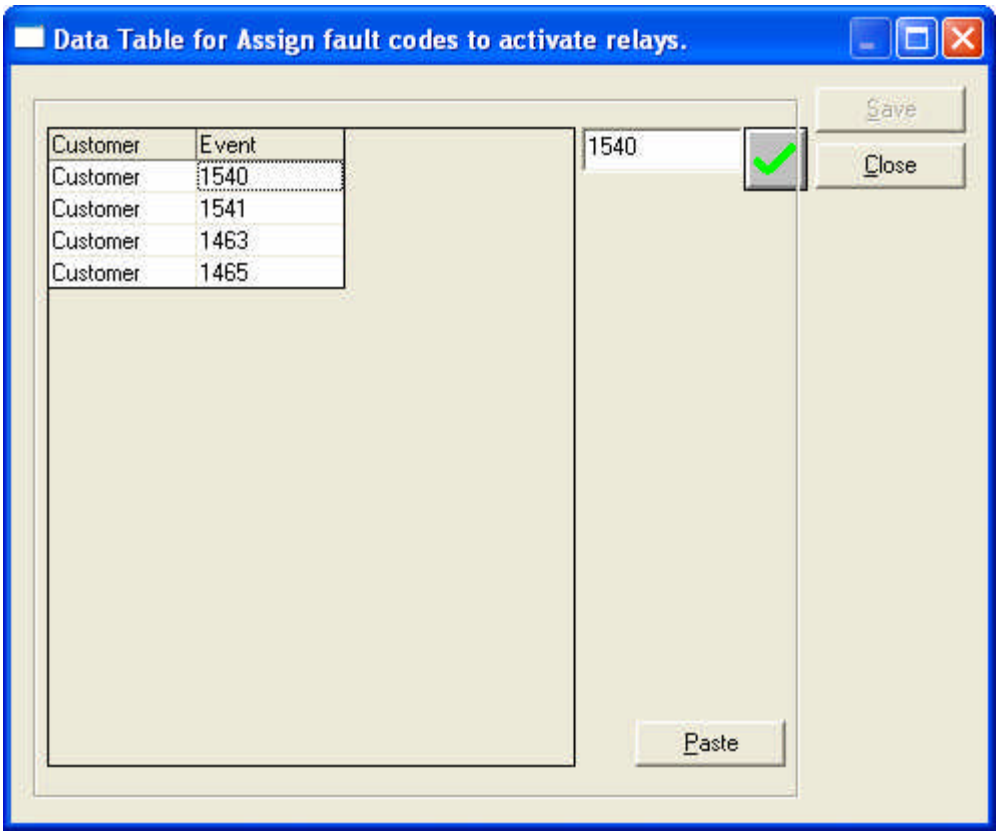
In this section we'll review setting some of the PCC 2100's configurable parameters.

Customer Outputs

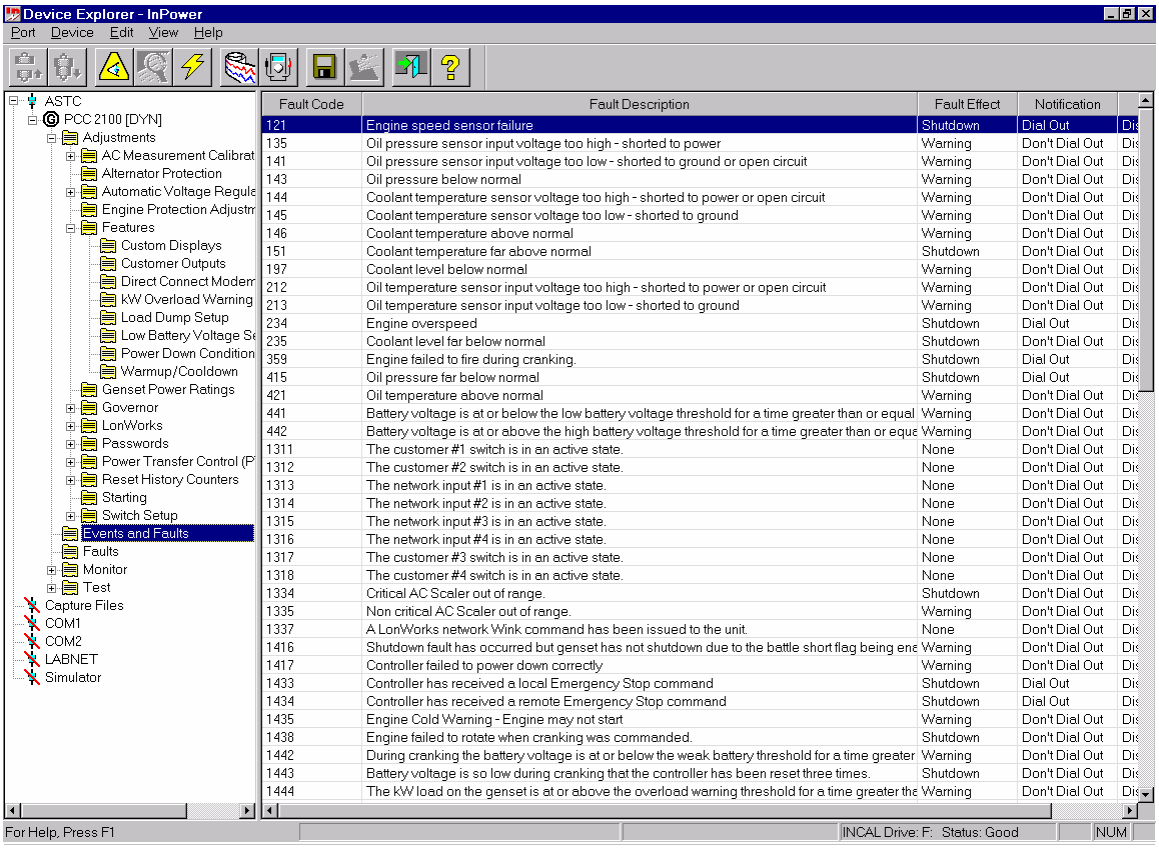
The PCC 2100's 4 output relays can be mapped to events and enabled or disabled by navigating to "Adjustment-Features-Customer Outputs". . The event code and color of each LED can be modified, and the LEDs can be enabled or disabled. Access this by navigating to "Adjustments-Features-Customer Outputs"



Event codes are set by clicking on "Data Table". These outputs can also be enabled or disabled by navigating to "Test-Outputs-Customer Outputs." Always remember to Save Adjustments or values will be changed back during the next start order. Note that these 4 relays are NOT the same as the Customer Outputs in the LonWorks section.



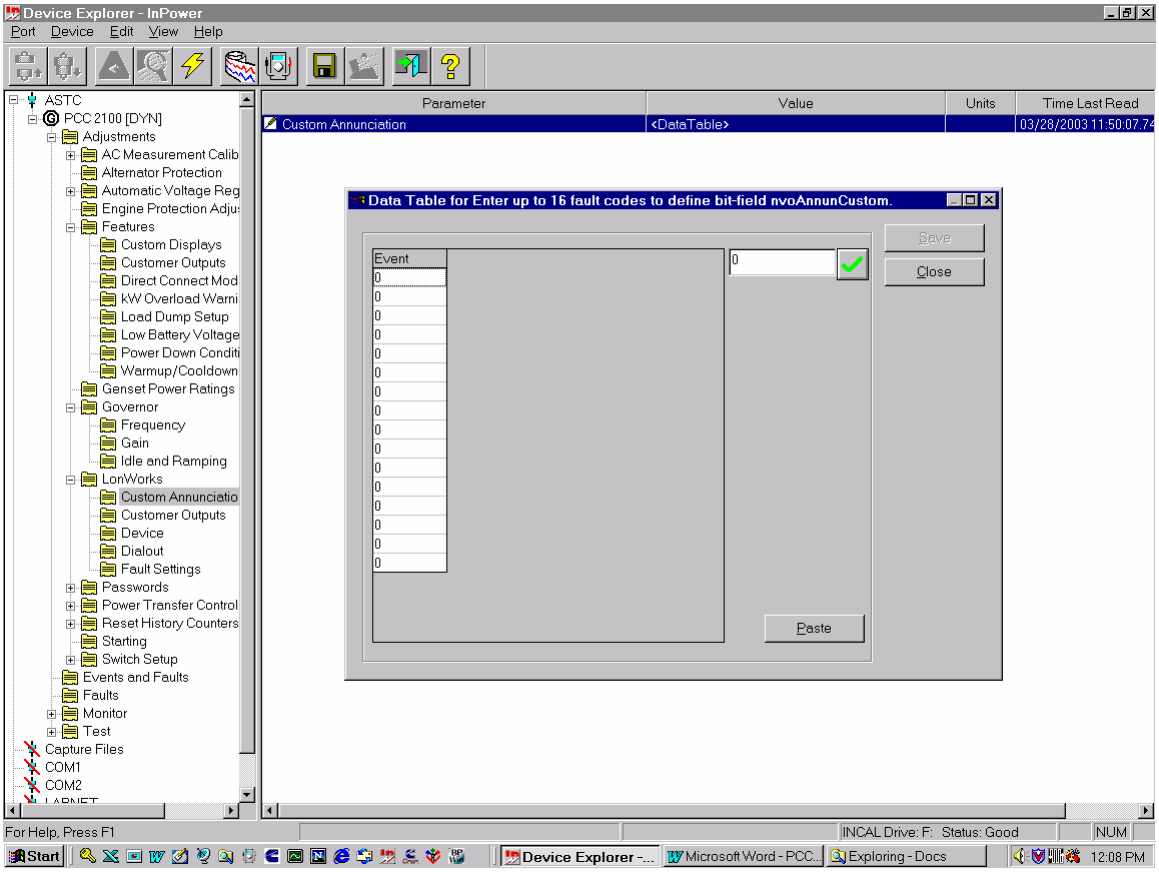
For a list of available events navigate to “Events and Faults”


Device Explorer - InPower
Port Device Edit View Help
ASTC
PCC 2100 [DYN]
Adjustments
AC Measurement Calibrat
Alternator Protection
Automatic Voltage Regula
Engine Protection Adjustm
Features
Custom Displays
Customer Outputs
Direct Connect Modem
kW Overload Warning
Load Dump Setup
Low Battery Voltage Se
Power Down Condition
Warmup/Cooldown
Genset Power Ratings
Governor
LonWorks
Passwords
Power Transfer Control (P
Reset History Counters
Starting
Switch Setup
Events and Faults
Faults
Monitor
Test
Capture Files
COM1
COM2
LABNET
Simulator
Fault Code
Fault Description
Fault Effect
Notification
121 Engine speed sensor failure Shutdown Dial Out
135 Oil pressure sensor input voltage too high - shorted to power Warning Don't Dial Out
141 Oil pressure sensor input voltage too low - shorted to ground or open circuit Warning Don't Dial Out
143 Oil pressure below normal Warning Don't Dial Out
144 Coolant temperature sensor voltage too high - shorted to power or open circuit Warning Don't Dial Out
145 Coolant temperature sensor voltage too low - shorted to ground Warning Don't Dial Out
146 Coolant temperature above normal Warning Don't Dial Out
151 Coolant temperature far above normal Shutdown Don't Dial Out
197 Coolant level below normal Warning Don't Dial Out
212 Oil temperature sensor input voltage too high - shorted to power or open circuit Warning Don't Dial Out
213 Oil temperature sensor input voltage too low - shorted to ground Warning Don't Dial Out
234 Engine overspeed Shutdown Dial Out
235 Coolant level far below normal Shutdown Don't Dial Out
359 Engine failed to fire during cranking. Shutdown Dial Out
415 Oil pressure far below normal Shutdown Dial Out
421 Oil temperature above normal Warning Don't Dial Out
441 Battery voltage is at or below the low battery voltage threshold for a time greater than or equal Warning Don't Dial Out
442 Battery voltage is at or above the high battery voltage threshold for a time greater than or equ Warning Don't Dial Out
1311 The customer #1 switch is in an active state. None Don't Dial Out
1312 The customer #2 switch is in an active state. None Don't Dial Out
1313 The network input #1 is in an active state. None Don't Dial Out
1314 The network input #2 is in an active state. None Don't Dial Out
1315 The network input #3 is in an active state. None Don't Dial Out
1316 The network input #4 is in an active state. None Don't Dial Out
1317 The customer #3 switch is in an active state. None Don't Dial Out
1318 The customer #4 switch is in an active state. None Don't Dial Out
1334 Critical AC Scaler out of range. Shutdown Don't Dial Out
1335 Non critical AC Scaler out of range. Warning Don't Dial Out
1337 A LonWorks network Wink command has been issued to the unit. None Don't Dial Out
1416 Shutdown fault has occurred but genset has not shutdown due to the battle short flag being ena Warning Don't Dial Out
1417 Controller failed to power down correctly Warning Don't Dial Out
1433 Controller has received a local Emergency Stop command Shutdown Dial Out
1434 Controller has received a remote Emergency Stop command Shutdown Dial Out
1435 Engine Cold Warning - Engine may not start Warning Don't Dial Out
1438 Engine failed to rotate when cranking was commanded. Shutdown Don't Dial Out
1442 During cranking the battery voltage is at or below the weak battery threshold for a time greater Warning Don't Dial Out
1443 Battery voltage is so low during cranking that the controller has been reset three times. Shutdown Don't Dial Out
1444 The kW load on the genset is at or above the overload warning threshold for a time greater tha Warning Don't Dial Out
For Help, Press F1
INCAL Drive: F: Status: Good
NUM

LonWorks Custom Annunciation

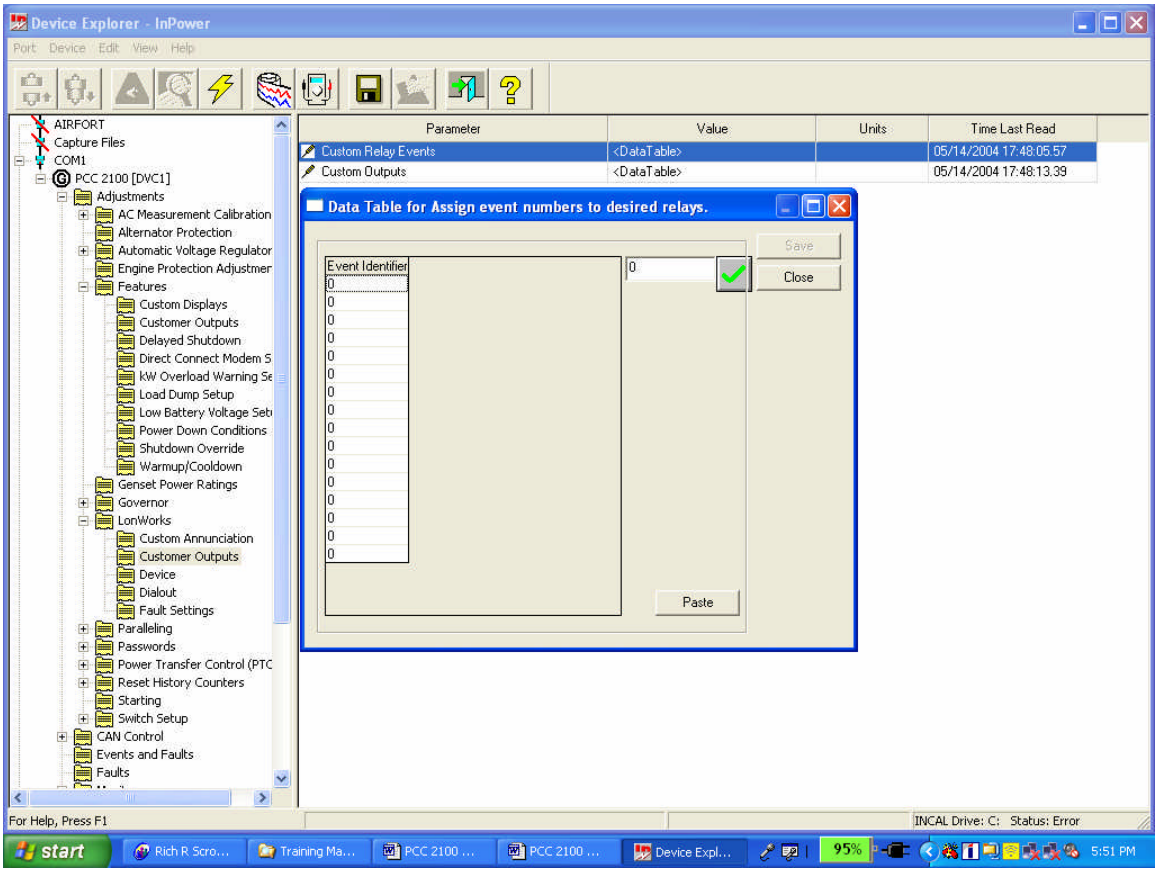
LEDs on a network annunciator can be mapped to PCC 2100 event codes using this feature and binding the network variable nvoAnnunCustom to the annunciator. This will work with either self-installed/autobound networks or LonMaker installed networks, however if the network is self-installed then the annunciator LED color, flash and horn can not be configured. They will default to red, horn on and no flash (although the horn can be disabled using a dipswitch on the annunciator. Navigate to "Adjustments-LonWorks-Custom Annunciation".

Also, when autobinding with an NFPA110 configuration, the top four events in this table will be mapped to the bottom four LEDs on the annunciator.



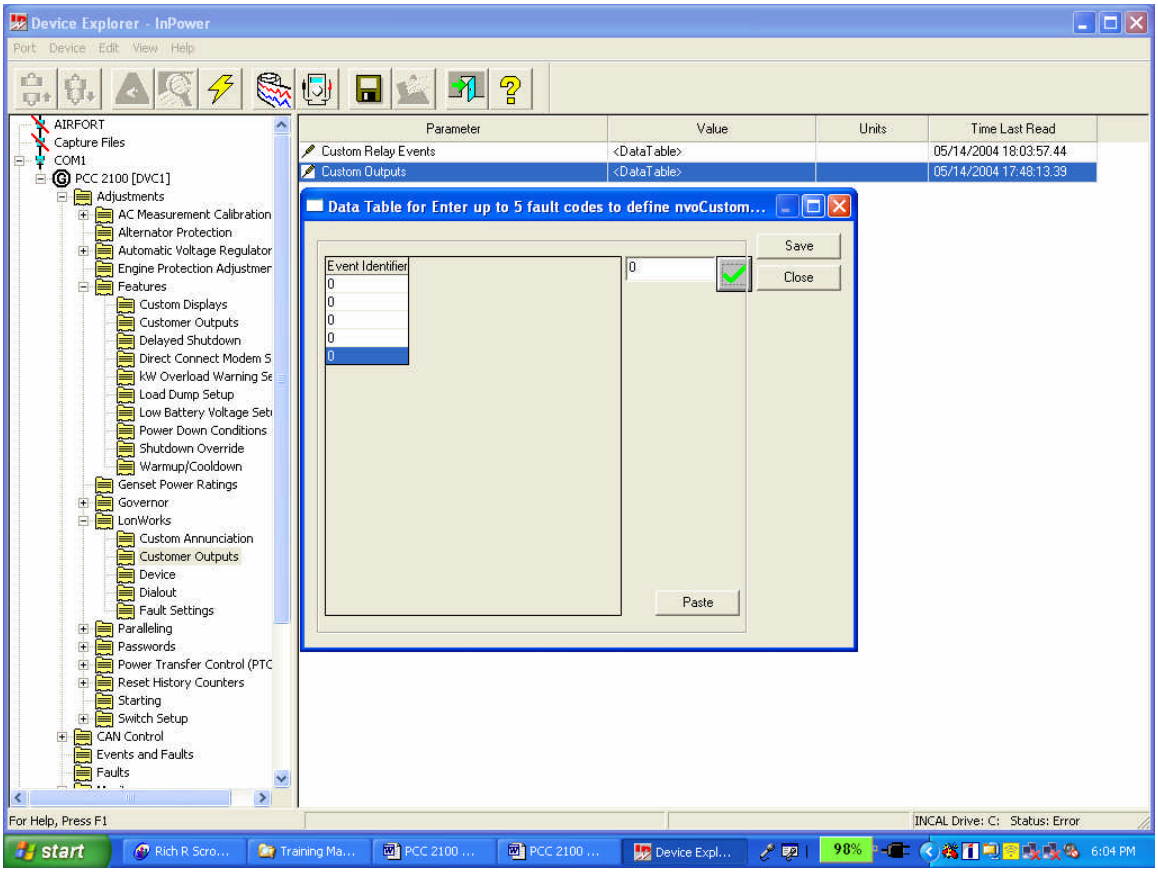
LonWorks Custom Relay Events

This feature allows the customer to map PCC 2100 events to the 16 relays on a DIM using the network variable nvoRelayCustom. The first 8 events can be mapped to the 8 relays on a DIM base board and the last 8 events can be mapped to the 8 relays of a DIM expansion board. This will work with either self-installed/autobound networks or LonMaker installed networks. Navigate to "Adjustments-LonWorks-Customer Outputs – Custom Relay Events".



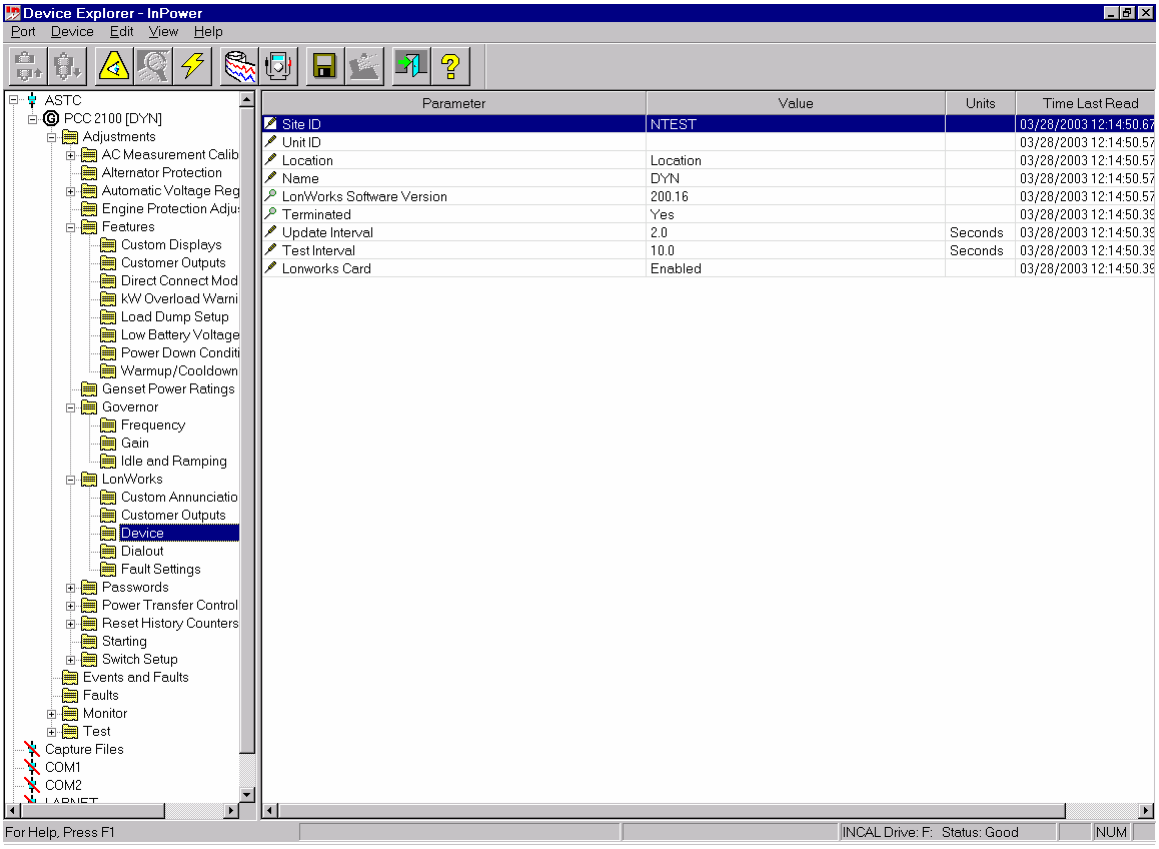
LonWorks Custom Outputs

This feature allows the customer to map PCC 2100 events to 5 network variables which can be bound to individual annunciator LEDs or DIM relays. This can only be done with LonMaker installed networks. Navigate to “Adjustments-LonWorks-Customer Outputs – Custom Outputs”.



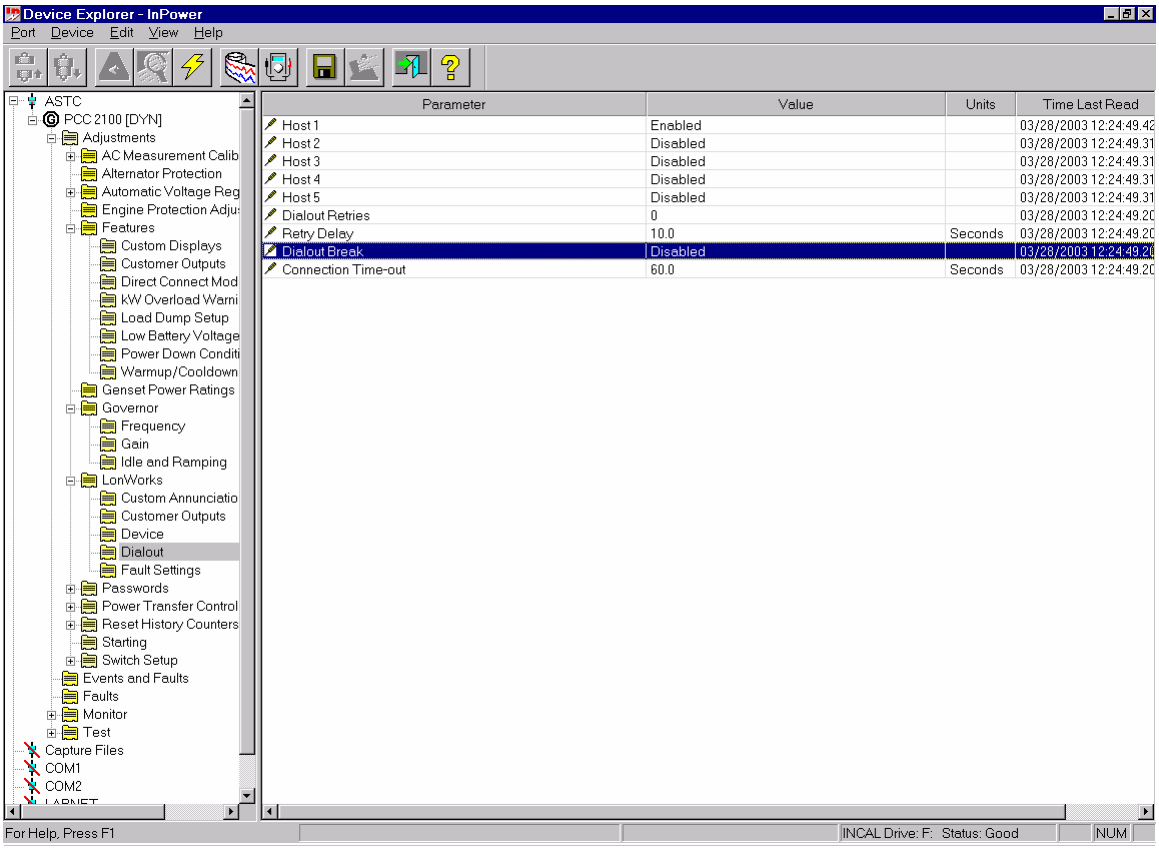
LonWorks Device

Several LonWorks parameters can be modified by navigating to “Adjustments-LonWorks-Device”. (Note that with the PCC 2100 the LonWorks card auto enables when the card is detected. “Enable is provided in InPower” so that LonWorks can be disabled if the card is removed.) Also, to properly deliver alarms to PCW 2.0 “Site ID” must be set to the network name and “Name” must be set to the device name used when setting up this network with LonMaker. The configuration plug in will write to this location on the NCM, however LonMaker by itself will not. If you don’t run the plug in you’ll have to write this information with InPower. After writing this information press the “Reset” pin on the PCC 2100 NCM for these changes to take effect.



Dialout

The alarm dialout characteristics can be set by navigating to “Adjustments-LonWorks-Dialout”. Up to 5 hosts can be enabled to receive alarms. (Note that host phone numbers are not set written to the device with InPower but are written to the network gateway (SLTA-10) using Echelon’s LinkManager program. If the “Dialout Break” parameter is enabled it will cause the network gateway to hang up an existing connection and dialout upon receipt of an alarm. If it is disabled it will not break an existing connection to deliver an alarm. After writing this information press the “Reset” pin on the PCC 2100 NCM for these changes to take effect. Note that dial out parameters can also be set using the configuration plug in.



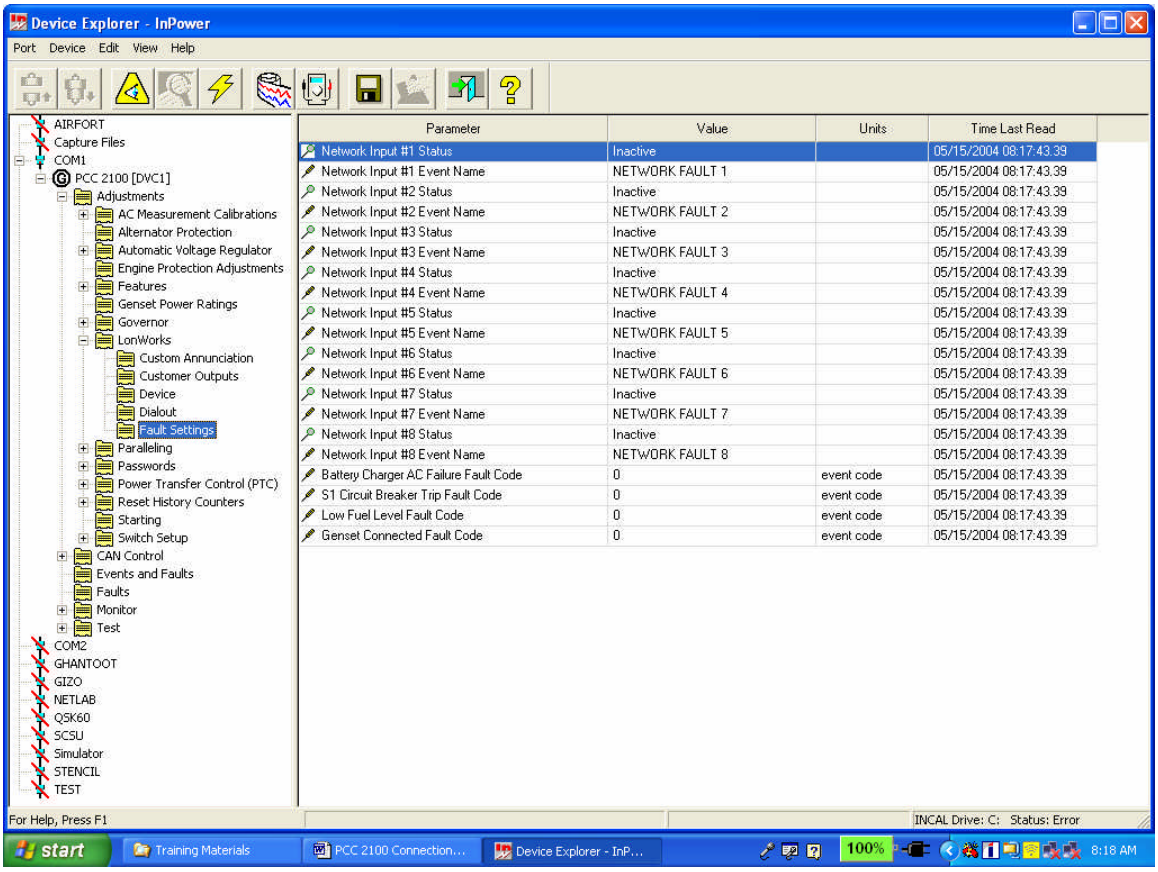
LonWorks Fault Settings

By navigating to “Adjustments-LonWorks-Fault Settings” event names can be assigned to the 8 network faults. These faults can be autobound to the states of the 8 customer inputs on a DIM, or they can be individually bound with LonMaker to output network variables on a DIM or some other device.

Also on this screen. a customer can enter event codes for Battery Charger Fail, S1 Circuit Breaker trip, Low Fuel Level and Genset Connected.

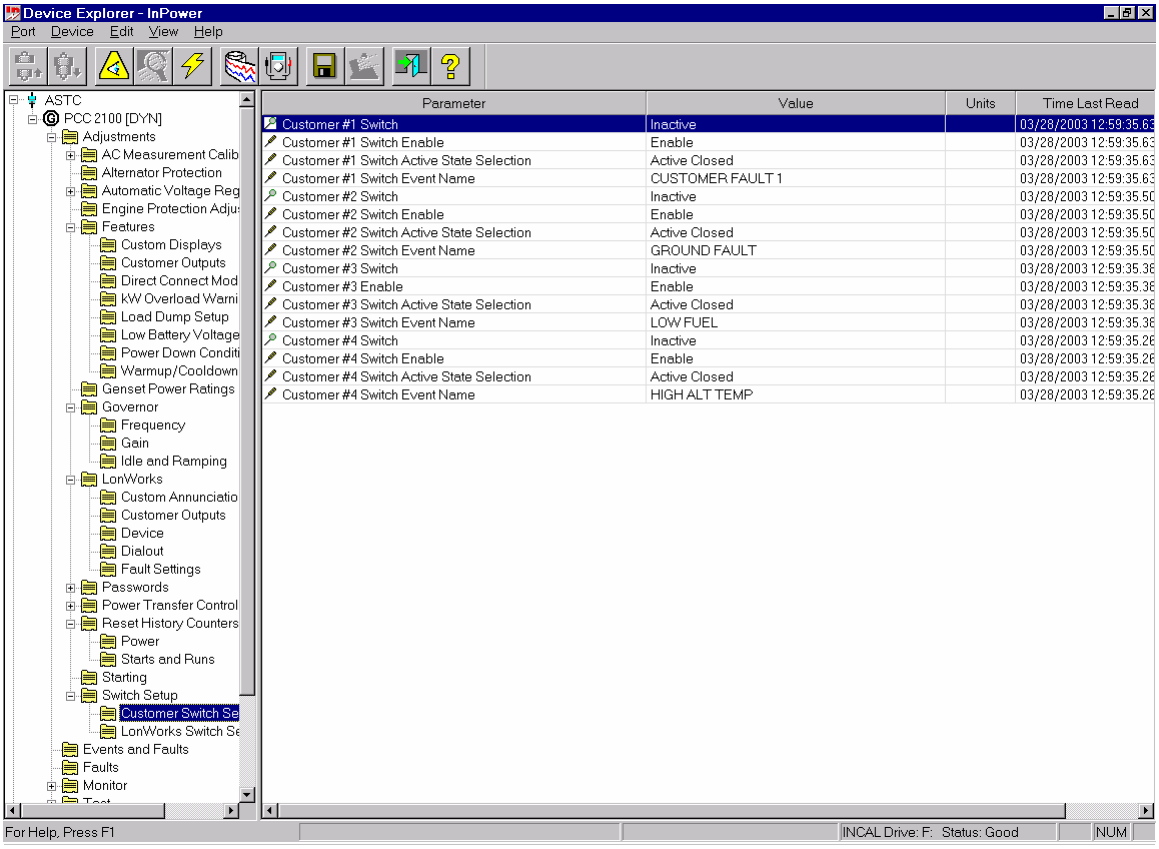
Battery Charger Fail, Low Fuel Level and Genset Connected events are all required for NFPA110 annunciation. S1 Circuit Breaker trip is part of the extended annunciation set.

A typical use for this feature would be in an application in which NFPA110 annunciation was required and a non-networked transfer switch is used. Two signals coming from the transfer switch (genset connected and battery charger fail) are required to be annunciated. The customer would wire those signals to two of the four customer switches on the 2100 and would enter the event codes for those inputs on this screen. The event codes for customer switches 1 through 4 are 1311, 1312, 1317 and 1318.



Customer Switch Setup

By navigating to “Adjustments-Switch Setup-Customer Switch Setup” a customer can configure the active state, enable or disable, and assign a name to each of the 4 customer inputs.



LonWorks Switch Setup

This section is the same as the “Adjustments-LonWorks-Fault Settings”

Customer Supplied Wiring Connections

By navigating to “Monitor-Customer Supplied Wiring Connections-Inputs” names can be assigned to the customer inputs, as is done in the “Customer Switch Setup” section. Names and active states for these inputs can also be assigned by navigating to “Test-Inputs-Customer Supplied Wiring Connections”.

Section 2. PCC 2100 Autobinding

The PCC 2100 can be self-installed on a network and autobound to one transfer switch (either an OTPC with an NCM card or a CCM-ATS) and up to 3 Annunciators and 4 DIMs (but no more than 5 DIMs and Annunciators combined.)

There are three different annunciation sets that the PCC 2100 can send to an annunciator or DIM when autobound: NFPA 110, Extended and Custom. Here is a listing of the NFPA 110 and Extended sets:

NFPA 110

Field	Description	Event(s)
bit0	Check Genset	Common Warning or Shutdown Alarm
bit1	Genset Supplying Load	Genset Connected
bit2	Genset Running	Ready To Load (Genset Available)
bit3	Not In Auto	Not In Auto
bit4	High Battery Voltage	High Battery Voltage
bit5	Low Battery Voltage	Low Battery Voltage Weak Battery Dead Battery
bit6	Charger AC Failure	*Must be configured by user.*
bit7	Fail To Start	Fail To Start Fail To Crank
bit8	Low Coolant Temperature	Low Coolant Temperature
bit9	Pre-High Engine Temperature	High Engine Temperature Warning High Oil Temperature Warning
bit10	High Engine Temperature	High Engine Temperature Shutdown
bit11	Pre-Low Oil Pressure	Low Oil Pressure Warning
bit12	Low Oil Pressure	Low Oil Pressure Shutdown
bit13	Overspeed	Overspeed Overfrequency
bit14	Low Coolant Level	Low Coolant Level Warning Low Coolant Level Warning
bit15	Low Fuel Level	*Must be configured by user.*

Extended

Field	Description	Event(s)
bit0	Check Genset	Common Warning or Shutdown Alarm
bit1	Ground Fault	*Must be configured by user.*
bit2	High AC Voltage	High AC Voltage
bit3	Low AC Voltage	Low AC Voltage
bit4	Underfrequency	Underfrequency
bit5	Overload	Overload
bit6	Overcurrent	Overcurrent Warning Overcurrent Shutdown
bit7	Short Circuit	Short Circuit
bit8	Reverse kW	Reverse kW
bit9	Reverse kVAR	Reverse kVAR
bit10	Fail to Sync	*Not Supported*

Field	Description	Event(s)
bit11	Fail to Close	Fail to Close - Genset CB Fail to Close - Utility CB
bit12	Load Demand	*Not Supported*
bit13	Genset CB Tripped	*Must be configured by user.*
bit14	Utility CB Tripped	*Must be configured by user.*
bit15	Emergency Stop	Emergency Stop - Local Emergency Stop - Remote

For custom annunciation, the 16 events to be annunciated are set up using InPower as described in the "LonWorks Custom Annunciation" section. InPower is also used to set up the event code for the "Charger AC Failure", "Genset Connected" and "Low Fuel" bits in the NFPA 110-annunciation set and the "Utility CB Tripped" bit in the Extended annunciation set. This is described in the "LonWorks Fault Settings" section.

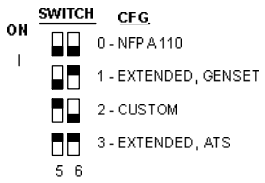
The PCC 2100 can also be bound to a DIM so 16 events on the PCC 2100 can be mapped to DIM relays. This is described in the "LonWorks Customer Outputs" section. The 8 DIM customer inputs can be mapped to the PCC 2100 Network Faults. This is described in the "LonWorks Fault Settings" section.

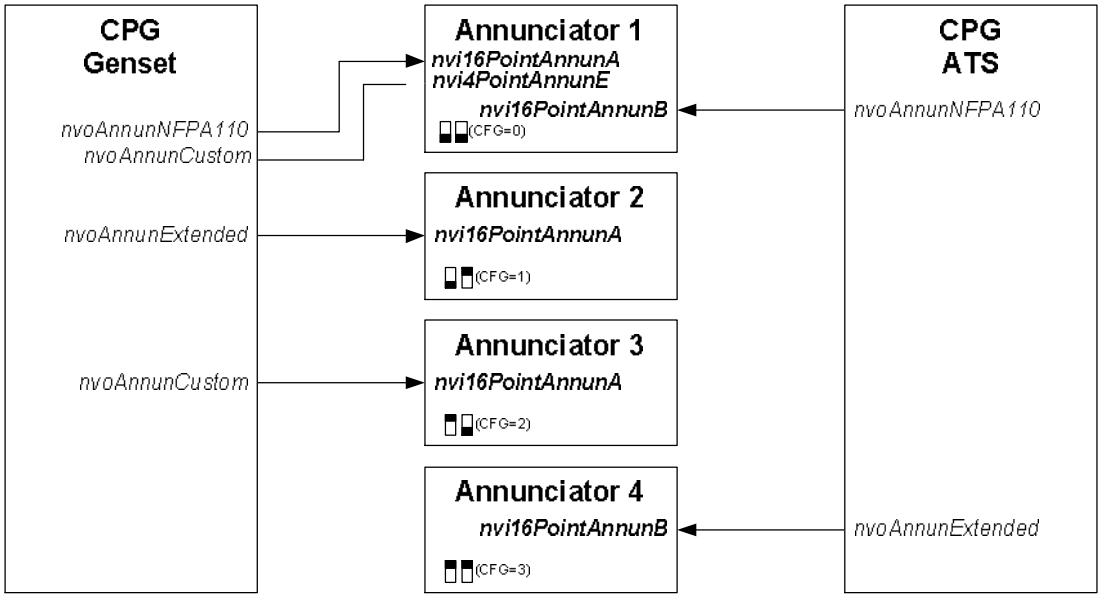
The PCC 2100 can also be autobound by a transfer switch so that the transfer switch can issue a start command to a genset over the network.

The Self-Install and Autobinding Process

1. Physically connect all devices to a twisted pair. Provide power to all devices.
2. Configure 2100 customer switch inputs using InPower as described above. For NFPA110 annunciation, Charger AC Fail, Genset Supplying load and Low Fuel are all required. A low fuel signal should always be wired to one of the customer switch inputs. A networked transfer switch will communicate status of Charger Fail and Genset Supplying Load events to the annunciator. If a non-networked transfer switch is used these signals will have to be wired to customer switch inputs on the 2100 and InPower must be used to assign the event codes to the annunciation set.
3. Install PCC 2100 to the network first. Press and hold the service pin for more than two seconds. The NCM will go through it's start up sequence with the "OK" and "I/O" LEDs flashing rapidly, then the "OK" LED will blink the node address set by the dip switch, pause, and repeat. The default node address for the PCC 2100 is 1, which will look like a steady ½ Hz pulse.
4. Install the ATS (either PC ATS or CCM-ATS) next if a networked ATS is used. If a networked ATS is not used skip this step. Make sure that the node address configuration dipswitch is set to a different address than the PCC 2100. Press and hold the service pin for more than two seconds. The device will go through its start up sequence then "OK" LED will blink the node address set by the dipswitch, pause, and repeat. The default node address for all CPG FT-10 transfer switch nodes is 2. It will bind its Start Command output variable with the PCC 2100's Start Command Input variable.
5. Install annunciator(s) next. Set the node address dipswitches to an address different than the PCC 2100 and transfer switch addresses. Set the configuration dipswitches according to the following diagram depending on which annunciation set you want to use.

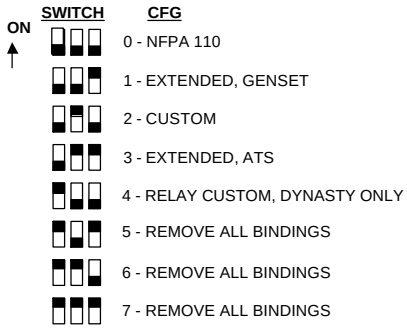
Annunciator AutoBinding

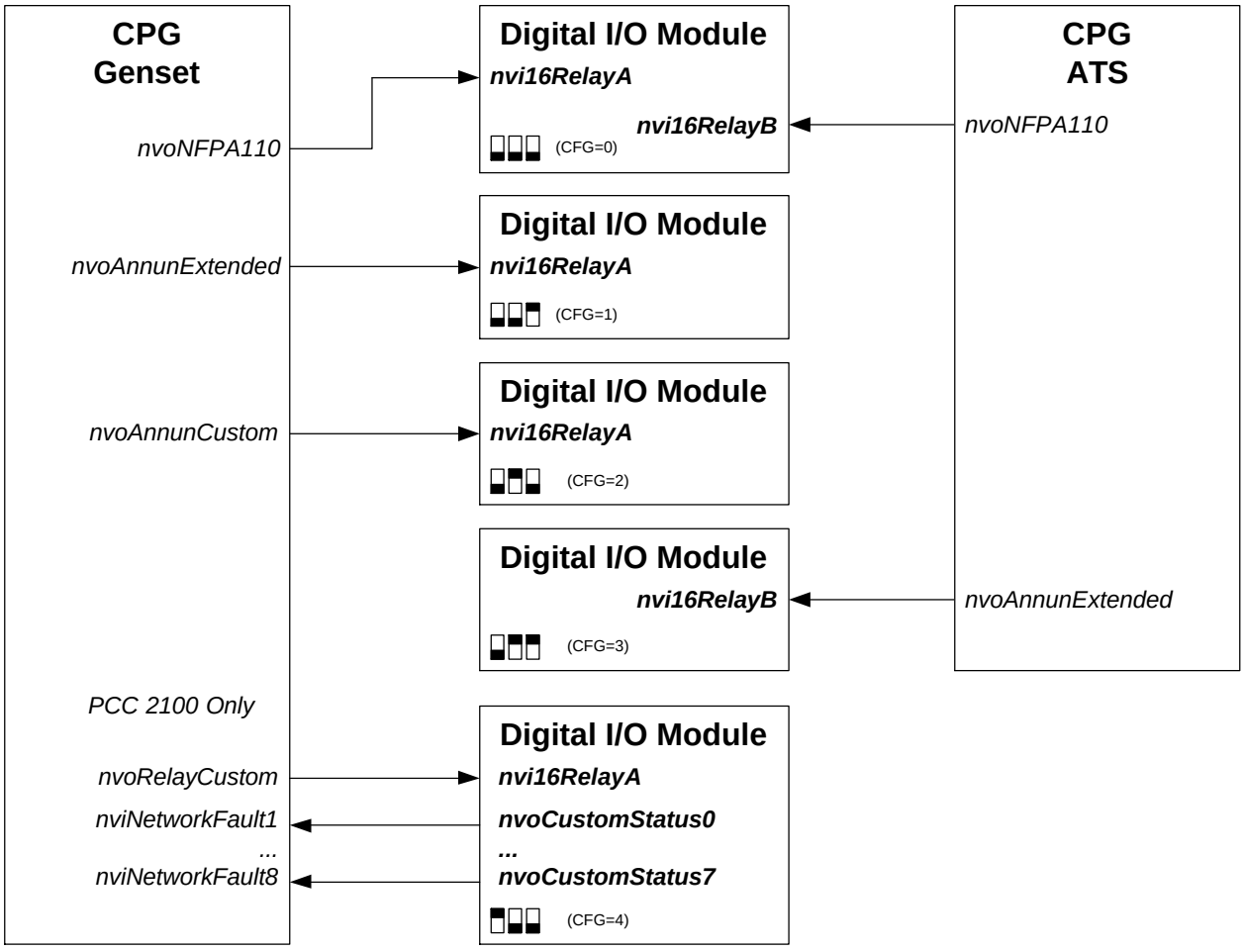




Note:nvoAnnunCustom - nvi4PointAnnunE binding in NFPA110 config is only valid for autobinding with PCC2100 or PCC3200 sets

DIM AutoBinding





After setting the node address and configuration dipswitches, press and hold the service pin for more than two seconds. The device will go through its start up sequence then "OK" LED will blink the node address set by the dip switch, pause, and repeat and the device will be bound to the correct annunciation set if the genset or transfer switch node has been correctly installed. The default node address for DIMs is 8.

Autobinding for NFPA 110 Annunciation with PCC 2100 and PC ATS

Physically install PCC 2100, PC ATS and Annunciator as stated above. Confirm that they each have a different node address and that the annunciator is configured for NFPA 110 annunciation. Press and hold the service pins for the PCC 2100, PCC ATS and annunciator in that order. Confirm that all three devices are blinking their node addresses and the Network LED on the annunciator is green. Note that the transfer switch NFPA 110 annunciation set is as follows.

Field	Description	Latched	Event	Default
bit0	ATS Common Alarm	N	ATS Common Alarm	0
bit1	Genset Supplying Load	N	Source2 Connected	0
bit2	NA	-		0
bit3	Not In Auto	N	Not In Auto	0
bit4..bit5	NA	-		0
bit6	Charger AC Failure	Y	Charger AC Failure	0
bit7..bit15	NA	-		0

Note that there will be 4 LEDs on the annunciator that both the ATS and the PCC 2100 could try to control. The annunciator will treat this as an OR function. If the event is true from either the PCC 2100 or the ATS the LED will be on.

Autobinding for NFPA 110 Annunciation with PCC 2100 and a non-networked transfer switch

In this situation, the Genset supplying and charger failure signals are wired to PCC 2100 customer inputs. Use Inpower to tell the 2100 which event is assigned to which input. Follow the same procedure as is followed when autobinding with a networked transfer switch, simply skipping the step of installing the switch.